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Royal Commission on Matters of Health and Safety Arising from the Use of Asbestos in Ontario

WORKER ATTITUDES ABOUT HEALTH AND SAFETY IN THREE ASBESTOS BRAKE MANUFACTURING PLANTS

A Study Prepared By:

Sally Luce

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Study Series

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for

The Royal Commission on Matters of Health and Safety

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This study was commissioned by the Royal Commission on Asbestos, but the views expressed herein are those of the authors and do not necessarily reflect the views of the members of the Commission or its staff.

February 1982

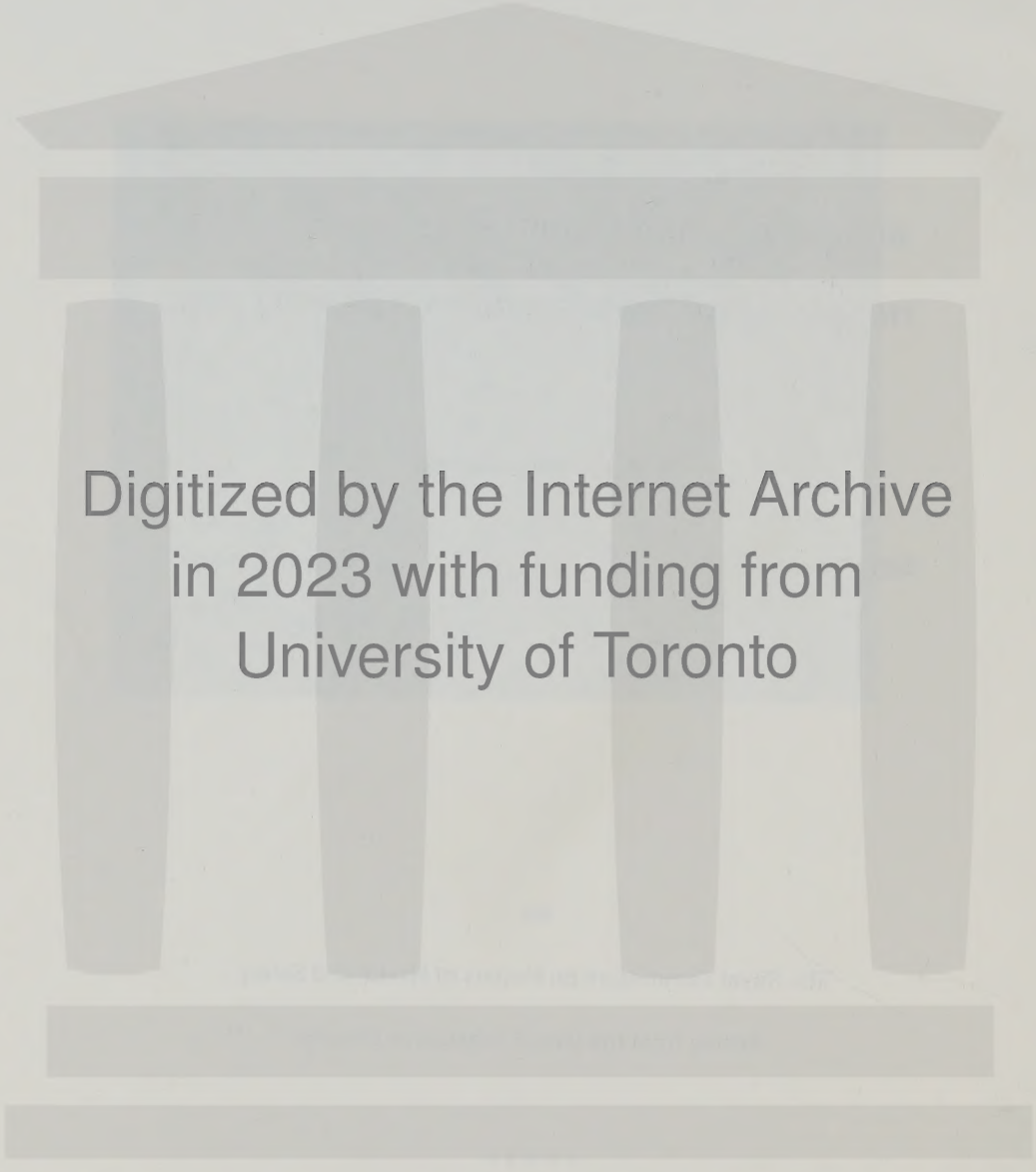

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF TABLES (CONT'D)

LIST OF TABLES (CONT'D)

CHAPTER 1

I N T R O D U C T I O N

The employees of asbestos products manufacturers are among the parties interested in matters of health and safety arising out of the use of asbestos in Ontario. On behalf of the Ontario Royal Commission on Asbestos, we surveyed workers' attitudes, knowledge, and concerns regarding health and safety. We sampled workers from three plants which manufacture friction materials used in brake assemblies. These materials are largely composed of asbestos. Their manufacture exposes workers to dust containing asbestos fibres. Our study examined the workers' attitudes toward the effectiveness of unions, employers, and government inspectors in dealing with health and safety; workers' perceptions of the degree of health risk in their work; workers' knowledge of their rights and protections pertaining to health and safety; and the importance workers attach to health and safety relative to other issues such as wages. Finally, we solicited general comments from respondents regarding the problems and concerns which they felt the Royal Commission should address.

While the purpose of this study was to sample workers at each plant to assess their attitudes and concerns, a second purpose was to gather additional impressions about the health and safety problems in this industry based on our discussions with plant and union officials prior to the survey, our tours of the plants, and unsolicited information and observations given by our respondents during the interviews. These

additional data provided us with a fuller understanding of the health and safety system and its problems than we would have obtained with the interview questions alone.

We wish to emphasize here that we have surveyed workers to determine what they believe or perceive to be true regarding their unions, employers, and government; the risks in the workplace, and their rights and protections against such risks; and the relative importance of health and safety. The findings which we report here are reflections of respondents' subjective reality rather than objective truth. In cases where there appear to be discrepancies between workers' perceptions and the true state of affairs, however, the reader is reminded that such discrepancies usually exist because the workers are misinformed or uninformed regarding certain issues or practices. We will leave it to the reader to infer in such instances who, if anyone, is responsible for the discrepancies.

The three plants from which we drew respondents were Abex in Lindsay, Raybestos-Manhattan in Peterborough, and Certified Brakes in Mississauga. Workers in all three plants are organized by the United Steelworkers of America. All three companies are subsidiaries of American multinationals. All three companies manufacture brake materials for automobiles, trucks, and buses. Production workers in these plants are exposed to asbestos fibres because friction materials are formed from 'raw' asbestos and other substances. The mixture is then pressed, baked, drilled, sanded, and, in some plants, riveted to a metal surface. Different stages of the manufacturing process create varying amounts of dust which contain asbestos fibres.

In Chapter 2, the friction material manufacturing process is described in more detail with particular aspects of each plant's

operation noted. The health and safety rules and practices at each plant are also described. In Chapter 3, we outline our research methods including research hypotheses, the sampling procedures, the questionnaire, the interview format, and some of the problems encountered in interviewing workers at Certified Brakes in Mississauga. The descriptive statistics based on the questionnaire items are presented for each plant in Chapter 4, and in Chapter 5 some of the relations between attitudes and other measures are reported. In Chapter 6, we present our conclusions.

CHAPTER 2

FRICTION MATERIAL MANUFACTURING

In this chapter we will outline the brake materials production process in the three plants where the respondents work. We will include here some observations made during our plant tours.

In the first stage of production, various materials are mixed together in the compounding or mixing area of the plant which is located above the plant floor on a mezzanine. Bags of chemicals are transported to the compounding area, opened, and emptied into the mixing machines. Ingredients must be carefully weighed according to strict recipes. Several different types of compounds may be mixed depending on the desired product. One difference is between wet and dry mixes. Wet mixes contain resins in liquid form, have the consistency of wet sand, and may therefore release less dust. Dry mixes, because they are more like dry sand, may be dustier. A typical brake lining compound is roughly 50% asbestos, and often includes other dangerous substances such as lead and formaldehyde. Carbolic resins which are also used may produce skin rashes on some workers. The compounding area has the highest potential for raw asbestos dust exposure to workers because of the presence of uncovered raw asbestos fibres. Test readings from the Ministry of Labour confirm this, and respirators are usually mandatory in this area.

After the compounds are mixed in machines straddling the mezzanine and main floor, they are fed into the pre-form presses. Depending on the

plant, the compounds may either be transported in carts pushed by workers, or this process may be completely automated using conveyor belts. The pre-form presses form the compound into briquettes of specified sizes and shapes. At this point, the material is still soft and crumbly, again with the potential for relatively high levels of airborne asbestos fibre concentrations.

At the next step in the production process, the pre-formed briquettes are compressed to one-half to one-third of their original thickness; then the pads or linings are cured in large ovens at temperatures of about 400° Fahrenheit. This baking gives the linings a ceramic consistency.

The brake linings are then finished and drilled using sanders and drill presses. At this stage considerable dust is generated, most of which is drawn up by the ventilation systems. The final production stage involves binding the linings to the metal brake drums or disk brake assembly either by riveting or with adhesives. Complete assemblies are stamped, inspected, boxed, and shipped out across North America.

Health risks aside, work in a brake manufacturing plant is hardly appealing. At all plants we visited, there were aspects of the environment which were undesirable: unpleasant odours from the chemicals used, the constant loud noise of the machinery, and the heat[1] given off by the ovens; all contribute to an unpleasant atmosphere. By and large, the work is monotonous, requiring little or no skill. Because many jobs involve machine tending and heavy material handling, the risk of accident is always present. The pay is low with most jobs paying between $6.50 and $7.50/hour as of August 1981, the time of our interviews. (See Table 2.1 for wage comparisons among the plants and the Toronto average manufacturing wages for similar occupations.)

TABLE 2.1

Comparable Wage Rates at the Three Work Sites and Toronto Manufacturing Averages August 1981

Job Title	Abex (1)	Raybestos(2)	Certified(3)	Estimated Average Mfg. Wage Toronto (4)
Janitor	6.48	7.19	6.10	7.90
Mixing	6.89	7.59	6.70	--
Press Operators	6.94	7.59	6.50	--
Grinding, Drilling	6.60	7.39	6.50	--
Shipping Clerk	6.60	7.51	6.57	8.05
Maintenance Helper	6.80	7.39	6.97	--
Labourer	6.48	--	--	7.29
Machinist* (Top Grade)	8.38	8.61	8.83	10.51
Electrician*	8.38	8.61	--	11.26
Operating Engineer*	7.92	8.45		9.90

* Skilled jobs are held by very few employees in each plant.

(1) In effect until October 6, 1981. A new two-year contract has just been negotiated raising wages by $0.90/hour across the board for each year.
(2) In effect until April 30, 1982. On May 1, 1982, $0.65/hr. will be added to all rates until April 30, 1983.
(3) In effect until January 12, 1982 and includes a $0.21/hr. payout from a cost of living allowance (COLA) clause. Some workers are also entitled to a production bonus.
(4) October 1980 wage rates come fron Labour Canada's annual survey of community wage rates; to bring them up to August 1981 the rates have been increased by 10%.

Abex, Raybestos-Manhattan, and Certified Brakes are three of the largest producers of friction materials in Ontario. Some of the important differences among the three companies, and their workforces, are described below.

Abex

The Abex plant in Lindsay, Ontario was built in 1947. The manufactured friction material from Abex is used for drum brakes. Abex supplies the replacement (secondary) markets mostly within Ontario, with some exports to U.S. and Mexico. The plant is the smallest of the three we studied. It has only about 150 production workers, and also has the least automated and the smallest capacity machinery.

Lindsay is a small town with a population of about 15,000, located 50 km southwest of Peterborough. Though its economic base is mainly agricultural, Lindsay has a small number of other manufacturing plants, including Union Carbide and Uniroyal. Abex workers live in Lindsay, surrounding small towns, and rural farm areas. Many workers farm on a part-time basis as we learned when we tried to arrange interviews during the haying season. Lindsay is a relatively isolated labour market with limited local employment opportunities. Apparently, many workers are reluctant to leave their rural environment and believe that work is not available in Peterborough, the closest larger labour market. Some may not wish to give up their farming which either longer distance commuting or moving to a larger centre would entail.

The union local is small. There are no full-time union officers and no union hall. Meetings take place in a local lodge.

The collective agreement makes little reference to health and safety except that a joint committee will be set up "to promote safety in the plant, make periodic inspections throughout the plant and submit recommendations on safety measures for management's consideration." There are no safety clothing or equipment allowances. The management provides safety glasses, respirators, and earplugs free of charge.

At the time of our interviews, wage rates were 10% below those at Raybestos for common jobs. Raybestos had just settled a contract prior to our study, and Abex was about to begin contract negotiations. As a result of the new Abex agreement which adds $0.90/hour to all rates, wage rates are now virtually equal at the two plants.

The Joint Health and Safety Committee at Abex does not appear to make active efforts to deal with health and safety issues. It mainly appears to react to worker complaints or refusals to work. At the time of our visit, there was no worker representative for the midnight shift. Some younger workers expressed dissatisfaction with their union representatives, feeling they were more concerned about the status quo than health and safety.

There are few plant rules dealing with occupational health at Abex. Smoking, eating, and drinking are prohibited in the plant area (outside of the lunchroom). Safety glasses are mandatory and, with only the exception of a few grinding machines which tested out over 2 fibres, respirators are not required. Respirators are available, but some workers told us the disposable ones provided were uncomfortable to use. Without an exhalation valve on the respirator, breathing is difficult, particularly on a warm day. A number of respondents felt that it was impossible to wear both safety glasses and masks because of the added discomfort from the elastic on the respirator pressing on the glasses;

therefore, they wore only the mandatory glasses. We were given safety glasses on our plant tour but were not offered respirators.

No safety clothing, lockers, or showering facilities are provided. On the day we toured the plant, many workers had their shirts unbuttoned and a few wore no shirts.

At Abex, all promotions and lateral transfers are controlled by seniority provided one has the physical ability to do the job. There is a well-defined hierarchy of jobs which has developed over the years. Workers are typically hired at the compounding division (mixing and pre-forming) and bid out to jobs further along the production line as they accumulate seniority. Many Abex workers believe that jobs involving the cured asbestos compound are less dangerous than jobs involving earlier stages of production.

Because the production process in this plant is less mechanized than at Raybestos or Certified, Abex workers appear to have more direct contact with asbestos in the mixing, pre-forming, and finishing operations. Nevertheless, most machines are well ventilated, and on the basis of Ontario Ministry of Labour tests, their asbestos fibre levels are at least as good as the other two plants. Since May 1979, three sets of tests (generated by 50 air samples) have had time-weighted averages (TWA's) below 0.4 fibres.[2] No doubt these results are due to a $250,000 ventilation system installed in 1976. There is one note of caution regarding the dust tests. All tests are done on the day or afternoon shift. Although fewer employees work the midnight shift, much of the compound mixing is done at night for the next day. Some workers believe that the night shift is by far the "dirtiest." (See the tables summarizing comments to the Royal Commission in Chapter 4.)

Little in the way of education about asbestos dangers has been

provided by the union. The company now gives all new workers a bulletin on asbestos dangers prepared by Johns-Manville.

The company provided us with a list of 149 bargaining unit members. Half were randomly selected as our sample. Of these 74, 56 could be reached (many were on vacation), and 45 agreed to be interviewed. The interviews were conducted at the workers' own homes over a ten-day period. As the interviewing progressed, it became clear that the study was a major topic of discussion at the plant. Although respondents were still co-operative in the later interviews, we noticed an increasing degree of cynicism about the study and the Commission generally. More than one respondent suggested that the Commission's money would be better used to aid asbestosis victims and their families rather than interviewing workers.

Raybestos-Manhattan

The second set of respondents worked at the Raybestos-Manhattan plant in Peterborough. During 1981, Raybestos-Manhattan expanded, with production slated to triple from 40,000 units per week in July 1981, to 115,000 by December 1981. All brake shoes for Raybestos' North American market will be manufactured at the Peterborough plant following the closure of its U.S. brake drum plant.[3] About half of the current production is for the Canadian replacement market, making Raybestos one of the largest manufacturers of drum brakes in Canada. Despite the expansion, the company and the union are aware that drum brakes will be eventually displaced by discs (by 1990), leaving the long-term future of the plant in doubt. This was the only company where the employer's co-operation in this study was not determined by local managers but by the head office.

Peterborough, with a population of 60,000, represents a medium-sized labour market. Major companies in Peterborough, aside from Raybestos, include Canadian General Electric, Outboard Marine, and Quaker Oats. Although it is not really feasible to commute to Metropolitan Toronto, some Peterborough residents do commute to work in Oshawa.

The union local at this plant has a history of active involvement in health and safety issues. There had been health walkouts organized by the union in 1975 before the company moved to its new plant. The local has its own union hall, and a number of local officers have received training in occupational health and safety from the Ontario Federation of Labour and from the Steelworkers.

In the collective agreement, the company provides allowances for safety boots and prescription safety glasses. The safety and health article states:

> The Company and the Union recognize their responsibility to provide a safe and healthful working environment for employees. The Company and the Union agree to co-operate in maintaining and improving a safe and healthful working environment in accordance with the Ontario Occupational Health and Safety Act. The parties agree to use their best efforts jointly to achieve these objectives.

The plant follows hygiene standards recommended by the U.S. National Institute for Occupational Safety and Health (NIOSH). There is a double locker system, showers for male employees, and the provision of one set of work clothes, laundered weekly. This system minimizes the risk of asbestos dust being embedded in workers' own clothes. Women currently do not work in the areas where protective clothing is issued or showers are required.

There is a lengthy list of safety rules which were developed by the Joint Health and Safety Committee. Those dealing with personal

protection are reproduced below:

(a) Safety glasses and foot protection must be worn during actual working hours.

(b) Gloves, respirators, and/or ear protection must be worn properly on all operations so designated by management.

(c) Rings, bracelets, wrist watches, and necklaces should be removed before starting work on any machine and remain off during all working hours.

(d) Wear suitable work clothing and keep shoes in good repair.

(e) Hair protection must be worn while operating machines with exposed rotating parts (example: single spindle drill).

(f) Always wash before eating and before leaving the plant.

(g) Eating and drinking inside the plant are restricted to the lunch-room at specified times.

(h) If you are susceptible to industrial skin disease, barrier creams are available for your use.

(i) All employees on jobs requiring showers MUST shower before leaving the plant.

Respirators are available throughout the plant, but are not worn by many workers because they are uncomfortable. Union officials also made it clear that despite the safety rules which require respirators in some locations, the supervisors often do not enforce the rules for respirators.

Compared to Abex, the Raybestos Joint Health and Safety Committee is more active, and both sides believe that the Committee is functioning effectively within its mandate.

In our tour of the plant, we saw much evidence of the ongoing modifications of the plant for increased production. As we will note later in more detail, this disruption caused some of the respondents difficulty in rating whether the plant's health and safety conditions had improved over the last year. Generally employees felt that this disruption made it difficult to comment fairly on the conditions. Officials told us that the alterations would include a number of improved

facilities for employees: showers and a double locker system for women employees; and a new employee lunchroom further removed from the centre of the plant floor which would therefore be less exposed to dust from various plant operations.

The present lunchroom is located centrally in the plant which may allow circulating dust to fall on employees' food. Several respondents were concerned about dust in the lunchroom. We asked plant officials about employees wearing dusty overalls into the lunchroom as a possible source of contamination of their own and others' food. The officials indicated that they were considering having workers from the "dirtier" areas eat lunch at a separate time from the "cleaner" employees (i.e., those who do not wear overalls and are in less dusty areas).

Some of our respondents asked us to note the old machinery. They told us that alterations to the equipment made at various times had severely reduced the effectiveness of the safety features of the equipment. We did see 'patched up' equipment on the tour, but we could not assess its safety. We did note, as requested by some respondents, that while most of the machines have dust collectors (in the form of hoods over the top of the machinery), there was no apparent means of safely collecting and disposing of the shavings and other larger-sized residues created in the various drilling and polishing processes. These residues, which were visible all around the machines, could create additional dust hazards when stepped on if this further broke and stirred these residues. The removal of these residues (we saw no one actually removing them) could create additional dust hazards if not done carefully.

We saw workers in various phases of the plant operation. Most workers in the mixing and compounding area were not wearing their respirators although there were bales of raw asbestos on a table with

their ends opened ready for the mixing process. We noted a fine layer of asbestos dust on these opened bales, and to our surprise a protective mask lying face-side down on this surface. The owner of this mask did put it on when he dumped the asbestos down a chute for mixing. We were not offered respirators while touring this or other parts of the plant although we were required to wear safety glasses and toe caps for our shoes.

Ministry of Labour tests at Raybestos in 1979 and 1980 included 33 dust samples. Only two were above the guideline TWA of 2 fibres. The average TWA was 0.86 fibres per cubic centimetre which was a bit higher than the average at Abex.

From a bargaining unit list of 126 workers, a random sample of 68 was obtained. Of the 51 workers contacted, only 4 refused an interview. In addition, we cancelled one appointment, leaving us with 46 respondents.

Certified Brakes

The final company in our survey was Certified Brakes. This company has two plants located near the Toronto International Airport, but our study was limited to its new plant opened in 1979 in Mississauga. Of friction material manufacturers this company has the largest number of employees in Canada. About one-third of its 900 employees are exposed to asbestos in the Mississauga plant. Located in Canada's largest labour market, Metropolitan Toronto, workers at this site should have the greatest mobility of the three locations studied. In fact, they face severe barriers to labour mobility. Most workers employed at Certified Brakes, and for that matter at all Toronto area asbestos manufacturing operations, have little fluency in English. Management at Certified estimated that 3% of its workers spoke English as their first

language. The largest group of workers at Mississauga speak Spanish (60%), most coming from Latin America. Italians, Vietnamese, and East Indians are other prominent groups. Within the company, workers may bid for positions which become vacant based on seniority. Many workers indicated that the friction material manufacturing section of the Mississauga plant is the least desirable place to work; therefore workers vie for jobs in other areas of the company.[4] Workers in this section of the plant tend to have the least seniority and the poorest English language skills. For many workers this is their first job in Canada.

Despite the difficulty in comparing wages across the three plants, it should be noted that wages at Certified were about 5% lower than the Abex rates as of August 1981, and the Certified agreement expired three months after the Abex agreement.[5]

The linguistic diversity of the workers clearly has an impact on daily management-union relationships generally, and specifically with regard to health and safety. By management's own admission, their overall accident rate is extremely high. There has been great conflict over health conditions in the past including health walkouts at the old plant, and at the Mississauga plant shortly after its opening. Nevertheless, the union and management have made considerable gains in the collective agreement in the development of the joint responsibility system for occupational health and safety.

The collective agreement outlines an elaborate set of rights and responsibilities for the Joint Health and Safety Committee which are based on The Occupational Health and Safety Act (Bill 70) but do go beyond it, giving the union representatives greater access to the plant

and documentation. (The full text of these articles is in Appendix A at the end of this study.) Other sections of the collective agreement guarantee allowances for safety boots and prescription glasses and provide for two extra rest periods on exceptionally warm days.

The protections outlined in the agreement are much more elaborate that those enjoyed by workers at Abex and Raybestos. Although these latter workers are protected by The Occupational Health and Safety Act automatically, the inclusion of the Bill 70 provisions in the collective agreement makes these rights and protections more accessible to workers and allows the union to grieve any failure to comply with the health and safety regulations. There is no doubt that the proximity of the plant to District 6 (Ontario) Headquarters of the U.S.W.A. has served this local well in negotiations. In addition, the company has made a real effort to change its previously poor -- and in management's opinion undeserved -- reputation on health and safety. The workings of the joint health and safety committee are discussed in detail by Gunderson and Swinton in a separate study prepared for the Royal Commission on Asbestos.[6]

The plant is by far the most automated and visibly cleanest which we visited. The mixing and pre-forming areas, where asbestos exposure is highest, are completely glass enclosed. There are presently two mixing hoppers. One is fed conventionally, but the other hopper has a bag opening device so that workers are not exposed to dust while opening bags as they are in the other two plants. In the more automated process, fewer people are required to feed the mixing machines. This area has been tested out consistently at a level of 2-3 fibres per cubic centimetre, and consequently respirators are mandatory. Despite this, we were not offered respirators when we toured this area, and we saw one employee working there who was not wearing a mask.

Following the mixing procedure, the mixture goes directly into two huge pre-form presses in the lower level of the plant. No machine tenders are necessary for this process; there is only one maintenance technician who changes the pre-form dies and oversees the machine operations. Fibre counts here again exceed 2 fibres/cc, and the technician is required to wear a mask. Once the pre-form briquettes are automatically moved up to the main floor of the plant, the process is similar to the other plants, though the machinery is more sophisticated with higher production capacity and better ventilation. Hence, in this area the air quality readings are well below 1 fibre. In 1981 Labour Ministry tests, the non-closed plant floor readings ranged from a TWA of 0.30 to 0.27 fibres.

Workers are provided with high quality respirators throughout the plant. In particular, the disposable respirators which are available have an air outtake valve which facilitates breathing more so than the respirators used at Abex. Nonetheless, only a few workers who were not required to wear masks chose to use them. There is a double locker system with showers and three sets of work clothes. Women's shower facilities are under construction. Only about one-half of the workers were wearing the overalls on the day we visited. This may have been due to the high temperatures in the plant.

Throughout the plant large vacuums are used regularly by maintenance staff to remove any dust. The cafeteria for lunch and coffee breaks is separate from the rest of the plant. Workers are asked to use personal vacuums to remove dust from their clothing before using the cafeteria. Smoking, drinking, or eating are prohibited elsewhere in the plant (i.e., outside of the cafeteria).

Throughout the main floor of the plant are signs warning about the dangers of asbestos and advocating appropriate caution. It is not clear

to whom these signs are addressed as so few workers can read English. No warning signs appear in any language other than English.

Overall, both the plant's cleanliness and its health and safety responsibility system are impressive. We must comment, however, that managers described their employees to us in extremely pejorative terms. One stated that workers were always ready to follow any rabble rouser and alleged that few union officials or members of the rank and file really cared about safety. In his opinion,'health and safety'was often used as a negotiating tool, to be traded away for something the leaders really wanted. One manager stated that workers sometimes tried to become involved in minor accidents hoping to get workers' compensation. Without commenting on the factual basis of their attitudes, it is clear that there is hostility between management and labour. (Labour's views will be outlined in detail in Chapter 4.)

The linguistic diversity of the Certified workforce created sampling problems. We originally selected a random sample of 95 from the 293 exposed workers at the Mississauga plant. However, the company's computer listing, from which we drew the sample, contained many errors. Addresses were often incorrect, and many workers either did not have phones, or did not have phones in their own names. In addition, virtually none of the contacted employees with Hispanic or Italian surnames spoke any English. Finally, a number of English-speaking people whom we contacted worked in the Martingrove Plant -- not at the Mississauga plant as the computer listing indicated.

The questionnaires had been translated into Spanish and Italian prior to our arrival. We had planned to conduct the interviews in the company's training room with Spanish and Italian respondents answering the written questionnaire with the occasional assistance of our regular

interviewers and a translator. This plan failed because few immigrant workers had even minimal English skills, and virtually all refused to be interviewed on company premises (presumably fearing a lack of anonymity).

All of these problems forced us to supplement the random sample with a convenience sample in order to obtain some data. We selected all employees from the population with Anglo-Saxon, East-Indian, Germanic, and Eastern European surnames assuming they would more likely speak English. From this group of approximately 35 employees, we conducted a total of 10 interviews in English. With only one full-time Spanish and a part-time Italian translator, we decided to limit the Hispanic and Italian samples to employees living in the northwestern part of Metropolitan Toronto (within 15 miles of the plant) to reduce travel time and increase the number of interviews we could conduct during our week in Toronto. Of the roughly 60 Hispanics in the revised sample, the Spanish translator interviewed 13, whereas our Italian translator could only arrange 3 interviews from the 20 workers she tried to contact.

Clearly the Certified sample is a special case. In all statistical summaries which follow, Certified data will be presented separately. We trust that the Certified data will provide some relevant information to the Commission, despite the sampling problems. The limitations of this sample are discussed in some detail in Chapter 4.

FOOTNOTES TO CHAPTER 2

1. The heat may only be a problem during the summer months.

2. Time-weighted averages are the average fibre concentration of air samples collected over a four- or eight-hour period.

3. Union officials said that the company had been threatening to close either the Peterborough or the U.S. plant for the last year or so.

4. Workers prefer the Martingrove plant because it has better access to mass transit. Within the Mississauga plant, the metal stamping section (for brake shoe and pad assemblies) is preferred because there is no asbestos exposure.

5. Negotiations for a new contract were still in progress at the time of writing.

6. Morley Gunderson and Katherine Swinton. Collective Bargaining and Asbestos Dangers at the Workplace. Study No. 1 prepared for the Royal Commission on Asbestos (Toronto: The Commission, December 1981)

CHAPTER 3

RESEARCH METHODS

The Questionnaire

The questionnaire was constructed to measure a large number of objective characteristics and subjective attitudes of workers in asbestos friction material (brake lining) manufacturing firms. (The questionnaire is reproduced in Appendix B at the end of this study.) Among the personal characteristics obtained were age, sex, wages, family size, language, seniority, shift worked, union participation, and previous illnesses. Many of these variables may be correlated with worker attitudes. Specific hypotheses will be outlined and tested later.

More subjective information which was collected can be divided into four categories: attitudes about the parties to the joint responsibility system; perceptions of risk associated with asbestos in the workplace; knowledge about workers' rights and protections vis à vis occupational health and safety; and finally, attitudes concerning the tradeoff between asbestos exposure and income/job security. This breakdown is somewhat arbitrary and is mainly used to simplify the description which follows.

Table 3.1 summarizes the major attitudinal statements/questions which refer to the union, management, the joint worker-management health and safety committee, workers, and government. Most of these items were read to the respondent by the interviewer as declarative statements. The respondent was asked to select one of six phrases printed on a card which

TABLE 3.1

Questionnaire Items Concerning Worker Attitudes to All Parties in the Health and Safety Responsibility System

Union

24 a. Overall, the union here does a good job for me in dealing with management when the contract is up.

24 c. Overall, the union here does a good job for me in day to day dealings with management.

25 c. The union gets management to follow health and safety regulations.

25 h. The union does its best to keep dust levels down at work.

Management

24 b. Overall, the management here does a good job in running the plant.

24 d. Overall, the management here does a good job in giving me good working conditions.

25 a. Management here cares about workers' health and safety.

25 g. Management here does its best to keep dust levels down at work.

Joint Committee

25 d. The joint health and safety committee here does a good job.

25 j. The joint health and safety committee does its best to keep the dust levels down at work.

Workers

25 b. I care about my health and safety at work.

25 i. My fellow workers do their best to keep dust levels down at work.

Government/Public Policy

25 e. Current laws about workers' health and safety are not good enough.

25 f. Government inspectors enforce health and safety regulations.

26. Who should be responsible for health and safety in your plant?

_____

28. Who would you say that government inspectors generally care most about?_____

42. "You have answered all my questions. Now you have the chance to tell the Royal Commission anything you feel it should know. I'll write down any things you have to say and make sure the Commission gets your comments. So, is there anything else that you would like me to tell the Royal Commission?"

_____

best summarized his or her opinion regarding the statement. These phrases were the following:

- Strongly Agree;
- Mildly Agree;
- Don't Agree or Disagree;
- Mildly Disagree;
- Strongly Disagree;
- Can't Say.

Responses have been coded on a five-point scale with (1) for strongly agree to (5) strongly disagree. ("Can't Say" responses were treated as missing data.) Because all statements were phrased positively (e.g., the union does a good job...), a higher average score indicates greater disagreement or a more negative attitude, and conversely, a lower average score indicates a more positive attitude or greater agreement with the items.

We have tried to construct an overall questionnaire which is as neutral as possible. Whenever a statement has been made with regard to management, an equivalent statement was provided for the union. For example:

Q. 25g. Management here does its best to keep dust levels down at work.

Q. 25h. The union does its best to keep dust levels down at work.

With regard to the union and management, we have included general statements about their conduct (24 a and c for the union; 24 b and d for management) as well as specific items about the effectiveness of the union and management in dealing with health and safety. Similar specific statements have been included for other parties in the responsibility system (25 d and j for the joint committee; 25 b and i for workers in general; and 25 e and f for government).

Three open-ended questions dealt with public policy. Workers were asked who should be responsible for health and safety (26), and who government inspectors care about (28). These two questions were coded to accommodate multiple responses because workers often gave more than one answer to these questions. The third question, asked at the end of the interview, gave the respondent "the chance to tell the Royal Commission anything you feel it should know" (42). Answers were recorded verbatim. A content analysis of these answers as well as some notable direct quotations have been included in the report of the findings.

Table 3.2 summarizes the questionnaire items concerning perceptions of risk. Five declarative statements were used to measure workers' opinions on the existence of a safe asbestos dust level (29 a); the degree of safety provided by clothing and equipment (29 d) and the plant's ventilation system (29 e); whether workers are aware of dust level variations (29 f); and if they would want a family member to work at the plant (29 h). These statements were again scored on a five-point scale.[1] Workers were also asked to compare plant conditions today with a year ago, and if conditions had changed, they were asked who or what

TABLE 3.2

Questionnaire Items Concerning Perceptions of Asbestos Risk in the Work Environment

29 a. A safe dust level can be set for the asbestos industry. If agreed [Probe] "What is the safe level?"_____ _____.

29 d. The safety clothing and equipment which I am given to use in this plant protects me from all asbestos dangers.

29 e. The ventilation [air cleaning] system here keeps the dust at a safe level.

29 f. Even when I can't see the dust, I can tell when dust levels are higher than normal.

29 h. I would tell a member of my family to take a job at this plant.

30. "Compared to last August, health and safety conditions in this plant have

____	greatly improved	(1)
____	slightly improved	(2)
____	not changed	(3)
____	slightly worsened	(4)
____	greatly worsened	(5)
____	can't say	(6)

If change [Probe] "Could you tell me why you said conditions [improved or worsened]?"_____

If change [Probe] "Who or what caused the change?"_____

31. "Where and when did you learn about the dangers of asbestos?" _____

37. "Do you know of any people in your plant who are or were sick because of dust at work?" Yes, No, or Can't Say)_____

a. If yes [Probe] Could you tell me, for each one you know, what kind of sickness they have or had?_____

38. "Have you ever been sick because of dust at work?" (Yes, No, Maybe, or Can't Say)_____

a. If yes [Probe] "What kind of sickness did/do you have?"_____

had caused the change (30). Some questions were used to establish the sources of respondents' perceptions of asbestos risk (31); whether they knew of any workers who had dust-related illnesses (37); or whether they had been ill themselves because of dust (38). For the latter two questions, we coded responses into three general types of dust-related illnesses known about (or personnally suffered): (1) asbestosis, silicosis; (2) cancers; (3) other respiratory illnesses such as emphysema, pneumonia, bronchitis or influenza. Once again, we note that these are categories created from respondents' reports of illnesses rather than any objective epidemiological evidence of illness.

Table 3.3 lists those items which assess the respondents' knowledge of their rights and protections under The Occupation Health and Safety Act. Workers were asked to name their worker health and safety representative (19 a); how often the government inspector has visited the plant (27); and what they have done and/or would do if dust levels were dangerously high (29 b, 39, 40).

Workers were also asked whether they have ever discussed dust level problems with management, union, or government officials (33, 34, 35); whether they had tried to learn the results of dust tests (36); and whether they had attended any meetings on occupational health. We did not code responses to this latter item because of the varying interpretations which workers gave to the question. Some workers identified a short informal conversation as a meeting, while we were in fact concerned with more formal occasions.

The final aspect of the questionnaire, and no doubt the most controversial, examined the respondents' willingness to trade off health and safety and/or job security for income. Obviously, all workers want complete safety if it costs nothing in return. Hypothetical questions in

TABLE 3.3

Questionnaire Items Concerning Knowledge of Rights and Protections

19 a. Name a worker health and safety rep who works on your shift.

_____

27. Since January 1 of this year how many visits of health and safety inspectors to this plant do you know of?_____

29 b. In (our) this plant, workers can refuse to do dangerous work without financial or other penalty.

33. "Have you ever spoken to your boss or other company people about the problems of asbestos dust in your work?" (Yes, No, or Can't Say)_____

a. What did you speak about?_____

b. "How was your problem solved [or question answered]?"_____

c. "Was the person you talked to on the joint health and safety committee?" (Yes, No, or Can't Say)_____

34. Same as above for union.

35. Same as above for government inspector.

36. "Have you ever tried to find out the results of dust tests in the plant?" (Yes, No, or Can't Say)_____

a. If yes,
"Did you find out the results? (Yes, No, or Can't Say)_____

b. If no,
"Why did't you get the results?_____

39. Since January 1, have you ever been faced with any dangerous work situation?" (Yes, No, or Can't Say)_____

If yes,
What did you do?_____

40. If you felt the dust levels in your work area were too high the next time you were at work, what would you do?_____

41. "Have you ever attended any special meetings, workships, or courses on occupational health? (Yes, No, or Can't Say)_____

If yes,

How many?_____and for each one
when_____
sponsor_____
duration_____
topics_____

this area tend to invite that kind of response. We tried to develop items (summarized in Table 3.4) which tapped workers' actions and allowed for cross-checking of workers' responses. We cannot overemphasize the point that any stated willingness of workers to trade off health and safety for income does not necessarily mean that workers are unconcerned about health and safety. This issue will be discussed in detail in the hypothesis section of this chapter.

One worker action indicative of a tradeoff between income and risk of exposure is the amount of overtime worked voluntarily. Respondents were asked what would be their preferred amount of monthly overtime (15). To the extent that workers are willing to work overtime, they are clearly favouring the additional premium wage to the additional margin of exposure.

Workers were also asked in an open-ended fashion to name and rank the most important collective bargaining issues (23). As already indicated, two of the union locals would begin their negotiations for a new contract soon after their members were interviewed (Abex immediately and at Certified in November); whereas the Raybestos local had just settled. As a result, this question was most relevant to the workers at the former two plants. Although this question was more hypothetical at Raybestos, it did give us some indication of possible unsatisfactorily resolved issues in the recently concluded contract. Two declarative statements were included dealing with tradeoffs between health and safety regulations and job security (29 c) and between asbestos danger and wages (29 g). Workers were again instructed to respond on the five-point scale.

The final question addressing the tradeoff issue (32) is quite complex, and considerable effort went into its structure and content. The statement about the Ontario Federation of Labour is straightforward:

TABLE 3.4

Questionnaire Items Concerning the Tradeoffs
Between Occupational Health and Safety and Other Issues

15. "If you had the chance, how many hours of overtime would you like to work each month?"_____

23. "When this contract is up, what will be the most important bargaining issue for you?

_____

"What is the second most important issue?"

_____

"What is the third most important issue?"

_____

What is the fourth most important issue?"

_____

29 c. Tougher health regulations in the asbestos industry will cause some workers to lose their jobs.

29 g. I would give up some of my wages if the plant could be made completely safe from asbestos dangers.

If agreed "What per cent of your pay would you be willing to give up?"_____

32. "Some studies show that asbestos affects peoples' health. The Ontario Federation of Labour has therefore said that there should be a law stopping the making and selling of asbestos products by 1985. Substitutes for asbestos exist, but they would raise the costs of brake linings by at least 20%.

Do you think such a law is a good idea?
(Yes, No, or Can't Say)_____

Why or why not?_____

it is a major recommendation of the O.F.L.'s submission to the Royal Commission.[2] It does, however, understate the O.F.L. position on the health hazards of asbestos. This caused some concern from the O.F.L. Another source of contention was the last sentence dealing with asbestos substitutes. First is the issue of extra cost. A study appended to the Bendix Corporation submission to the Royal Commission has estimated the cost of semi-metallic (asbestos-free) brake linings at 20% to 100% more than conventional linings.[3] We felt that a cost range would be too ambiguous, and given the fact that this was company supported research (where one could reasonably infer a greater likelihood of overestimation than underestimation), we selected the lower limit for the question. Raybestos management made it clear that 20% was an underestimate in its opinion. A number of union officials subsequently objected that 20% was too high. Nonetheless, we feel that 20% is a reasonable number (if not the exact one). In particular, it would be misleading to assume that a changeover to asbestos-free compounds would be costless to management, labour, and/or the public.

Certified Brake management brought up a second issue: whether semi-metallic or any available substitute represents a smaller health risk than asbestos. Since there is some evidence that the geometry of asbestos fibres enhances their virulence, this objection is well taken as the best substitutes may be structurally, if not chemically, similar to asbestos. The long-term effects of substitutes also may not be known. We were not, however, interested in presenting these arguments to our respondents. We wanted to know, instead, how workers would respond to the O.F.L recommendation in general terms. Would they tend to agree or disagree, and most importantly, what perceived knowledge about asbestos, fears about job loss, adequacy of current health protections, and/or

adequacy of substitutes would be cited to support their views? Management from Certified Brakes refused to co-operate with our study unless we removed the last sentence of the question, "substitutes for asbestos exist, but they would raise the cost of brake linings by at least 20%." As it turned out, the linguistic and sampling problems faced at Certified have made it a special case so that this deletion did not affect our other analyses.

The Interview

The questionnaire was administered through an interview. Interviews were usually held in respondents' homes, but occasionally in other places, with the interviewer reading the questionnaire items and recording the responses. We had anticipated from pre-testing that the interviews would take 30 to 60 minutes depending on the experiences reported.[4] While most interviews did take less than an hour, some took as long as 2 or 3 hours. Some respondents used the opportunity to discuss health, safety, and other plant-related issues in considerable depth -- often expanding extensively on their initial answers. Occasionally respondents asked the interviewers questions. To those who wanted to know more about the Royal Commission on Asbestos, we provided the Commission brochure. Sometimes in this reversal of the interview roles respondents asked us if they were sick or had asbestosis (some of this latter group had received an official letter which they did not understand). Also respondents occasionally asked us how dangerous their work was, or for some other information about the health and safety system. In these situations, we recommended that respondents contact their family doctors regarding any concerns about their health, or to contact a joint health and safety committee member regarding any

concerns about health or safety at work.

Respondents were assured that their anonymity would be protected. In this regard, we have taken care to omit reporting certain aspects of respondents' answers or comments. Generally speaking, the candid comments of the respondents are evidence of their trust that we could honour this assurance.

Research Hypotheses

A major purpose of this study was to report the frequencies of various responses or the mean (average) response for questionnaire items. In addition, our purpose was to examine a number of interrelationships between the responses to the items. For the most part, we had no hypotheses about the nature of these relationships; we were merely looking for patterns of responses.

On one area, however, we did have several major research hypotheses concerning the relationships between the risk-income tradeoff measures and other variables. A willingness to trade safety and health for income (or job security) may be the result of a number of factors. In particular, if workers have few employment alternatives, low wages, and substantial family responsibilities, there is little choice. We therefore expect that workers in a more isolated labour market (e.g., Lindsay), with lower wages, and with larger families will more willingly accept risks of asbestos exposure.

The temporal nature of asbestos risk may also increase the likelihood that some workers will accept it. Workers may not care as much about reducing future exposure if they have been exposed to high asbestos levels for many years. They may assume that if their health has

been affected by asbestos, the damage has already occurred. Workers with lesser degrees of exposure may be more willing to sacrifice wages or other benefits for reduced future exposure. It is this temporal issue which distinguishes occupational health from safety for many workers. A safety improvement negotiated into a collective agreement can be expected to reduce future danger for all workers; a reduced exposure level provides no such guarantee. Thus we expect that more senior employees (with greater past exposure) will be more willing to trade off future reductions for other items.

In a slightly different vein, one's willingness to sacrifice asbestos exposure for income depends on the information available and one's perceptions of the risk. It is presumed that respondents who were better informed on health and safety issues generally (measured by numerous items) will be more concerned about asbestos dangers. Probably the most dramatic way of increasing one's perception of asbestos risk is having a dust-related illness or knowing someone who suffered from dust-related disease. Those workers with personal knowledge of asbestos victims will be the most likely to accept less income in return for a reduction in asbestos risk.

One can also be concerned about asbestos risks, yet believe that current standards and safety practices in the plant provide sufficient protection from risks. Thus, some of our questions tapped the perceived adequacy of current standards and equipment and the perceived improvements in health and safety in the last year as possible mediators between knowledge of potential hazards and willingness to take risks.

One's concerns about the health-related aspects of asbestos may be mediated by one's smoking habits. Since most people are aware that more smoking is related to higher incidences of both respiratory and

cardiovascular disease, smokers will have already chosen to take greater risks with their health. We do not know, however, whether smokers' attitudes will be less antagonistic toward the parties in the health and safety system as the smokers themselves are already party to an unhealthy practice (smoking), or whether smokers will be more concerned about health because of the extra risks which face smokers who also are exposed to asbestos.

Table 3.5 summarizes the expected relationships between tradeoff and other variables. These hypotheses are tested using correlation and regression analyses in Chapter 5.

TABLE 3.5

Summary of Expected Relationships Between Tradeoff and Other Variables

Variable	Direction of Expected Relationship with the Willingness to Forego Income in Return for Reduced Health Risks
Wage Rate	Positive
Family Size	Negative
Age or Seniority	Negative
Objective Knowledge About Asbestos Danger	Positive
Personal Experience and/or Knowledge of Other Workers with Dust-Related Illnesses	Positive
Satisfaction with the Current Health and Safety Responsibility System	Negative
Smoking Habits	?

Methodological Problems

Before presenting any empirical results, we must discuss some of the inherent methodological problems involved in the study. Ideally, respondents should be interviewed without any preconceptions about the goals of the study and the nature of the questionnaire. Unavoidably, however, every respondent knew the study was conducted for the Royal Commission on Asbestos. No doubt participants had some idea of what would be asked and may have responded based on their perception of what the Royal Commission wanted to hear. This problem is exacerbated by the interviews being conducted over at least a four-day period at each work site, thus allowing for interaction between previous and upcoming participants. On balance, one would expect respondents to put more emphasis on health and safety issues, particularly with regard to asbestos, than if they were being interviewed for some other group. The extent of this bias is not known, but we do know that other preconceptions were also present. Some workers thought the Commission's role was to ban asbestos; others felt the Commission was just another waste of taxpayers' money; and a fairly large group thought (hoped?) that the Commission would raise their wages. In a slightly different vein, some workers thought they were being contacted because they had been found to have asbestosis or another dust-related disease.

In terms of research ethics, respondents should not be adversely affected by their participation in the study. Although we tried not to ask alarming questions, this was sometimes unavoidable, and thus we are concerned that some respondents may now be alarmed about the dangers of their work environment. Respondents' involvement in the study may have altered their previous beliefs about the safety of their work. We can

only hope that there were few adverse effects, and that the experience of the interview will move workers to seek greater information and alternatives rather than foster a feeling of helplessness. Indeed, we found it somewhat difficult to achieve a balance between asking relevant questions and avoiding alarming our respondents excessively. In many cases, we did not ask all the questions we wished (e.g., asking respondents to name all possible harmful effects of asbestos) because we were attempting to minimize the adverse reactions to the questionnaire.

In our questionnaire we also tried to achieve a balance between declarative statements to which respondents had to agree or disagree and open-ended statements to which they could freely respond. While the former type of question is easier to quantify and analyze, it has the disadvantage of not assessing other, possibly relevant, aspects of a respondent's opinion. The open-ended question, in contrast, is more difficult to code and analyze, requires more interviewer time, and can be subject to temporary memory failures. (A respondent may not recall the name of a health and safety representative, but may "know him to see him" or may recall his name when it is actually necessary to do so.) This type of question, however, provides a greater richness of detail and served, at least in this study, to provide very useful anecdotal information about workers and their attitudes.

FOOTNOTES TO CHAPTER 3

1. Based on respondents' answers, it was ultimately decided to code 29 h (I would tell a family member to take a job at this plant) as simply "yes" or "no" or "maybe." See Appendix C at the end of this study for all variable definitions.

2. Ontario Federation of Labour, Written submission to the Royal Commission on Asbestos, #35, January 1981.

3. See Bendix Corporation, Written submission to the Royal Commission on Asbestos, #65, June 1981. The estimate was taken from Michael G. Jacko, Charles M. Brunhofer and F. William Aldrich, "Non-Asbestos Frictional Materials" (Paper presented at the EPA/CPSC National Workshop on Substitutes for Asbestos, Arlington, Virginia, July 14, 1980), pp. 13-14.

4. The questionnaire was pretested at Asbestonos Corporation, a small Ottawa firm which relines odd-size brake drums. Four employees agreed to be interviewed. We used a draft version of the questionnaire for these interviews.

CHAPTER 4

EMPIRICAL RESULTS

Demographic Comparisons

Respondents in the three plants were compared across a number of demographic and other descriptive variables (see Table 4.1 for quantitative data, Table 4.2 for qualitative data). The average age of respondents in all three plants was between 37 and 41 years. The average length of employment in the plants, however, varied from just over 12 years (145 months) for Abex; to 8.5 years (103 months) for Raybestos; to 3.8 years (46 months) for Certified. The high standard deviation at Abex indicates a high variability in length of service among those interviewed. Our respondents worked an average of 8.2 and 1.9 hours of overtime in June for Abex and Raybestos respectively, and 2.5 hours of overtime in May for Certified. Using a t-test, a statistical test of the difference in means, the Abex and Raybestos workers' overtime hours in June were statistically different.[1] There were also wage differences among the plants. As of August 1, 1981, the average hourly wage of Abex respondents was $6.72; for Raybestos, $7.57; and for Certified, $6.48. The wages were significantly different between Abex and Raybestos, again using a t-test. The Abex respondents' wages were 11% lower than those of the Raybestos respondents. As indicated in Chapter 3, the wages were about 10% lower at Abex than they were at Raybestos for comparable jobs as of August 1. The small additional wage differences may be due to the

TABLE 4.1

Descriptive Statistics for Quantitative Demographic Data by Plant

	Abex		Raybestos		Certified	
Variable 1	Mean	SD (N)	Mean	SD (N)	Mean	SD (N)
Age[6]2	41.2	12.0(45)	37.2	13.8(45)	38.2	9.6(26)
Hourly Wage[8]	6.72	.21(41)***	7.57	.16(44)	6.48	.20(15)
No. of months employed[10]	145	133.1(45)	103	134(46)	46	33(26)
Hours of overtime in June[14]	8.2	11.7(44)***	1.9	5.8(43)	2.5	5.8(26)
Number in household[16]	3.0	1.3(45)	2.6	1.4(46)	3.9	1.6(26)
No. Union meetings attended since Jan. 1981[19b]	1.3	2.0(44)*	2.2	2.2(42)	1.2	1.8(26)

1. N = number of responses; SD = standard deviation. Numbers vary due to missing data.
2. Questionnaire item number is listed in brackets.

* Significant difference between means at Abex and Raybestos for a two-tail t-test at the .10 level.

*** Significant at the .01 level.

TABLE 4.2

Summary of Qualitative Demographic Data by Plant

ariable Category	Abex Freq.	Abex % (N)1	Raybestos Freq.	Raybestos % (N)1	Certified Freq.	Certified % (N)1
omen workers[2][4][3]	0	0(45)	7	15(46)	5	20(25)
on-English Interviews 5]	0	0(45)	0	0(45)	17	65(26)
espondent only wage arner	21	47	24	56	14	54
amily has 1 other art-time earner	9	20(45)	7	16(43)	1	4(26)
amily has at least ne other full-time arner 7]	15	33	12	28	11	42
nion office held n last 3 years 20]	6	13(45)	10	22(45)	3	12(26)
pplied for other jobs n last year 18]	5	11(45)	4	9(45)	6	23(26)
hifts worked:***						
day	25	56	22	48	14	54
evening	5	11(45)	18	39(46)	6	23(26)
night	7	16	6	13	6	23
swing 13]	8	18	0	0	0	0
lant Location:						
mixing	4	9	8	17	0	0
preform	6	14	11	24	4	29
ovens	3	7	3	7	1	7
drilling, polishing	13	30(43)	15	33(46)	4	29(14)
finished product	10	23	6	13	0	0
all over the plant	5	12	3	7	2	8
other 12]	2	5	0	0	3	12

Numbers vary due to missing data.

No statistical test was performed on this set due to stratification of sample.

Questionnaire item number is listed in brackets.

** χ^2 test for differences in proportions between Abex and Raybestos is significant at the .01 level.

different proportions of employees at each wage rate in the two plants, or there may have been some over-sampling of better paid employees at one plant. Most of the difference, however, appears to be due to different rates of pay for comparable jobs.[2] Abex respondents had an average household size of 3.0, with 47% being sole wage earners; Raybestos workers' households averaged 2.6 members, with 56% being sole wage earners; at Certified, households averaged 3.9 members, with 54% being sole wage earners. Raybestos respondents reported having attended an average of 2.2 union meetings since January as opposed to an average of 1.2 meetings at Abex and Certified. The slightly larger number at Raybestos may be due to meetings regarding the recent contract negotiations. Also, 22% of Raybestos workers, as opposed to 13% at Abex and 12% at Certified, reported having held union offices or committee memberships over the last three years.

There were no women in the Abex bargaining unit (and our sample), but 15% and 20% respectively of the Raybestos and Certified workers in our sample were women. The sampling was stratified by sex at Raybestos to ensure that women would be proportionally represented in the study. At Certified the majority (65%) of interviews was conducted in either Spanish or Italian. All interviews at the other plants were conducted in English. Due to the sampling problems discussed earlier, the English-speaking employees at Certified are over-represented in our sample, and among the non-English speakers, our sample over-represents both employees who were unafraid to talk to Commission "officials" and employees with telephones who had not changed residences recently.

Certified employees in our sample more frequently sought other employment during the last year (23%), followed by Abex (11%), with the lowest numbers at Raybestos(9%). In each plant we surveyed, about half

of our respondents worked the day shift. The rest of our Certified and Raybestos respondents worked fixed evening or night shifts, but at Abex 18% of our respondents worked a swing shift. There were statistical differences in shifts worked by our Abex and Raybestos respondents, but these differences were due to the swing shift at Abex. More importantly, the proportion of respondents working the more convenient day shift was similar in both plants as were the proportions working the other less convenient shifts.

The respondents were located throughout the plants in roughly equal proportions. However, Raybestos respondents more often worked in the compounding (mixing and pre-form) areas (41%) than Abex (23%), or Certified (29%) respondents. About 30% of respondents in each plant worked in drilling or polishing areas, 7% worked at the ovens, and 10% worked all over the plant. Finally, 23% and 13% of respondents from Abex and Raybestos respectively worked with the finished product. No Certified respondent was so employed.

This discussion of some of the descriptive data collected from the respondents at each plant is intended to supplement the necessarily more impressionistic descriptions of the plants provided earlier. The most noteworthy aspect of the descriptive data is the absence of many important statistical differences between Abex and Raybestos on these items.

Respondents' General Health and Medical Treatment

Our respondents generally viewed their health as good or very good (see Table 4.3). Over 82% of those at Abex, 91% at Raybestos, and 63% of

TABLE 4.3

Descriptive Statistics for
Respondents' General Health

Variable Category	Abex Freq.	Abex % (N)	Raybestos Freq.	Raybestos % (N)	Certified Freq.	Certified % (N)
Health Rating						
Very Good	18	40	19	43	5	21
Good	19	42	21	48	10	42
Fair	7	16(45)	1	2(44)	8	33(24)
Poor	1	2	3	7	1	4
[21]						
Doctor Seen in Last Year	28	62(45)	29	63(46)	16	67(24)
[21a]						
Illness Treated by Doctor						
Minor Respiratory	4	9	5	11	1	4
Major Respiratory	4	9	0	0	4	15
Breaks & Sprains	6	13**	16	35	2	8
Heart	2	4	1	2	1	4
Psychological	0	0(45)	2	4(46)	0	0(26)
Skin	3	7	0	0	0	0
Eye-Ear	3	7	4	9	0	0
Other Internal	0	0	4	9	1	4
Other	12	27	6	13	6	23
[21b]						
	Mean	SD(N)	Mean	SD(N)	Mean	SD(N)
Number Cigarettes Smoked the Previous Day	10.2	14.3(45)	10.3	11.3(46)	5.8	9.0(22)
[22a]						

**χ^2 test for differences in proportions between and Raybestos is significant at the .05 level.

those at Certified rated their health in these two categories. The greatest proportion of fair health ratings came from Certified with 33% from that plant using that category. Between 2% and 7% of respondents at each plant said they had poor health, but none of the respondents rated their health as very poor. This is not unexpected as employees with very poor health would probably be unable to work. About two-thirds of all respondents in each plant saw a doctor in the last year for a variety of illnesses and conditions. We classified these illnesses into the various categories shown in Table 4.3. Minor respiratory illnesses, such as colds and influenza, were the source of a visit to a doctor for 9%, 11%, and 4% of Abex, Raybestos, and Certified respondents respectively; whereas major respiratory (longer-term or chronic) illnesses, such as pneumonia or asthma, were the source of visits by 9%, 0%, and 15% of respondents at the three respective plants. Aside from the "other" category which contained a variety of different ailments, broken bones and sprains constituted the largest treatment category from our Abex (13%) and Raybestos (35%) respondents; whereas the major (longer-term and chronic) respiratory illness category was the largest for Certified (15%). Statistical comparisions between Abex and Raybestos on illnesses treated were only significant for breaks and sprains. Several of the Raybestos respondents told us voluntarily that their broken bones and sprains came from sports or other activities outside the workplace. Nevertheless, because we did not probe for this information systematically, we do not know for certain what proportion of these injuries did occur at work for any of the plants.

It should be noted that some respondents reported a variety of illnesses or conditions which required medical treatment. Also, these problems were reported in response to an open-ended question; thus

respondents may have failed to recall certain medical problems which were treated by a doctor in the past year.

Our respondents' smoking habits were similar at Abex and Raybestos, averaging just over 10 cigarettes per day. At Certified the average was lower at about 6 cigarettes per day. More workers at Abex (58%) were non-smokers than at Raybestos (41%) or Certified (55%).

Worker Attitudes About the Management, Government, and Unions

This section contains a summary of the workers' responses to those attitudinal items aimed at the parties to the health and safety responsibility system (see Table 4.4). These represent responses to statements requiring an answer on the five-point scale from strongly agree (1) to strongly disagree (5). Average scores are presented for each plant and with the exception of one attitude item (25e), all statements were phrased positively; thus the lower the average score, the more favourable the attitude. A response below 3.0 signifies agreement (strongly or weakly) with the statement, above 3.0 signifies disagreement.[3]

A noteworthy feature of Table 4.4 is the overall pattern by plants. Workers at Raybestos tended to have more favourable attitudes toward all parties than workers at Abex, and Certified workers generally had the least favourable attitudes. There were significant differences between Abex and Raybestos average scores for seven of the fourteen items, with Raybestos average scores typically being 0.3 to 0.6 points lower, indicating stronger agreement. Four of these items pertained to the efforts of union, management, fellow workers, and joint health and

TABLE 4.4

Descriptive Statistics for Ordinal Attitudes
Concerning Parties in the Health and Safety Responsibility System

Attitude	Abex		Raybestos		Certified	
	Mean	SD(N)	Mean	SD(N)	Mean	SD(N)
Union						
Good At Contract[24a][1]	2.03	1.16(36)	2.07	1.19(40)	3.52	1.58(25)
Good at Day-to-Day[24c]	1.92	1.00(36)	1.64	.87(39)	3.77	1.56(26)
Gets Mgmt. to Follow H & S [25c]	1.70	1.04(43)	1.42	.50(43)	2.96	1.80(26)
Keeps Dust Down at Work[25h]	2.16	1.29(44)***	1.37	.54(43)	2.84	1.65(25)
Management						
Good Running Plant [24b]	2.82	1.39(44)*	3.33	1.46(43)	3.36	1.68(25)
Gives Good Wrk. Conditions[24d]	3.09	1.38(45)***	2.33	1.23(43)	3.82	1.71(22)
Cares about H & S [25a]	2.55	1.35(44)	2.49	1.44(45)	3.48	1.66(25)
Keeps Dust Down at Work[25g]	2.60	1.56(45)***	1.83	1.18(46)	3.04	1.77(25)
Joint Health and Safety Committee						
Does a Good Job [25d]	2.19	1.27(42)**	1.63	1.00(43)	2.60	1.47(20)
Keeps Dust Down at Work[25j]	1.93*	1.14(40)*	1.49	.83(43)	2.70	1.63(20)
Workers						
I Care About H & S[25b]	1.13	.34(45)	1.00	.00(46)	1.00	.00(26)
Fellow Workers Keep Dust Down at Work[25i]	2.55	1.30(44)**	1.90	1.32(41)	2.17	1.66(24)
Government						
Laws Not Good Enough[25e]	2.34	1.21(38)	2.66	1.42(38)	2.38	1.64(24)
Inspectors Enforce H & S Regs.[25f]	2.59	1.55(37)	2.45	1.31(38)	3.00	1.52(20)

1. A score of 1 indicates strong agreement, 3 neutrality and 5 strong disagreement.
* Significant difference between mean response for Abex and Raybestos for a two-tail t-test at .10 level.
** Significant difference at .05 level.
*** Significant difference at .01 level.

safety committee members in keeping dust down at work. Nonetheless, Abex and Raybestos workers generally agreed with the all statements. Scores for both groups rarely exceeded 3.0, and were below 2.0 in four items for Abex, and in eight items for Raybestos. By contrast, the average scores for Certified exceeded 3.0 (signifying disagreement) for half of the statements, and the average attitude scores were often a full point higher than for Abex workers.

A somewhat surprising aspect of these results is that workers in all three plants viewed union and management more positively (or less negatively in the Certified case) in their roles vis à vis health and safety than in more general roles. For example, at Raybestos the workers gave the union marks of 2.07 and 1.64 respectively on the statements that the union does a good job at contract renegotiations (24a) and in day-to-day dealings with management (24c), in comparison to more favourable scores of 1.42 and 1.37 respectively for statements that the union gets management to follow health and safety regulations (25c) and the union helps keep dust levels down (25h). Likewise, Raybestos workers were more in agreement with statements that management cares about health and safety (25a) and keeps dust levels down (25g) than with statements about management's ability to run the plant (24b). A similar pattern was present at Abex, but not so distinctly at Certified. This pattern likely indicates a recognition on the part of workers that both the union and management are seriously trying to deal with occupational health and safety, perhaps more than on other contentious issues in the workplace.

At Abex and Raybestos, workers apparently felt that the current health and safety responsibility system is working well with the union (25c, 25h), and joint health and safety committees (25d, 25j) doing the best jobs (particularly at Raybestos where the average responses ranged

from 1.3 to 1.7). Management (25a, 25g) and government inspectors (25f) were given more qualified approval (scores of about 2.5).

When asked about their own concern with health and safety, virtually every respondent (including those at Certified) strongly agreed with the statement, "I care about health and safety." In retrospect, the highly socially desirable aspect of the item (25b) did not permit any discrimination among degrees of concern. This item will therefore not be analyzed further. When asked whether fellow workers try to keep dust levels down (25i), the responses were more varied. Although respondents generally agreed with the statement, workers at Abex and Raybestos scored their fellow workers below the union and joint committee, giving them about the same score as they gave management.

The Certified employees we interviewed were clearly less satisfied with their system. On average, they disagreed that management (25a, 25g) and government inspectors (25f) are doing a good job with respect to health and safety. They indicated that the union only does a fair job at health and safety (25c, 25h), but this was much better than at the negotiating table or in day-to-day contract administration. Only fellow workers (25i) and the joint committee (25d, 25j) were viewed favourably in trying to keep dust levels down. It should be noted that part of the higher level scores on all negative attitudes may stem from a cultural difference. Our Spanish-speaking respondents tended to agree or disagree strongly; they rarely used the "mildly" category. Hence, negative attitudes were almost always coded as "5." Nevertheless, it is remarkable that the most negative perceptions were recorded in the one work site which seemed to be the cleanest.

Finally, on the statement that "laws were <u>not</u> good enough" (25e), workers at all three plants disagreed slightly. This is also consistent

with their other attitudes that imply that workers believe the current system is working.

The Abex and Raybestos responses were merged for calculating simple correlations between pairs of attitudes (see Table 4.5). Correlations provide a measure of the association among the variables, and 'significant' statistical tests of correlations show that there is an association between the variables that is unlikely to be due to chance. Not surprisingly, items dealing with the same party are significantly correlated with each other. For example, all the union questions are highly correlated (24a, 24c, 25c, 25h), with the two general questions and two questions specific to health and safety being most strongly related with each other. These strong interrelationships will later allow us to create average attitude scores [e.g., union general = [(24a + 24c)/2)], union health and safety = [(25c + 25h)/2)], and management general = [(24b + 24d)/2)]].

More surprisingly, correlations of attitudes across the parties are positively and significantly correlated as well. For example, all of the 32 possible union, management, and joint committee intercorrelations are significant. The only exception is the statement concerning current laws (25e), which is uncorrelated with all but two of the other responses. As this item was purposely phrased in an inverse way, its lack of relationship may be due to some respondents being unaware that the statement was phrased negatively. It may also indicate that laws, as more abstract concepts, are not perceived as affecting health and safety in the same manner that individual people or groups of people affect health and safety. The ambiguity in interpreting this item made further use of this variable misleading.

The pattern of intercorrelations implies that workers have a fairly

TABLE 4.5

Correlation Coefficients Among Ordinal Attitudes
Concerning Parties in the Health and Safety Responsibility System
(Abex and Raybestos Combined)

Attitude	Union				Management				Joint Committee		Workers	Government	
	24a	24c	25c	25h	24b	24d	25a	25g	25d	25j	25i	25e	25f
Union													
Good at Contract [24a]	1.000												
Good at Day-to-Day[24c]	.605*** (70)[1]	1.000											
Gets MGMT. to Follow H & S[25c]	.467*** (73)	.589*** (72)	1.000										
Keeps Dust Down at Work[25h]	.182* (75)	.334*** (74)	.576*** (83)	1.000									
Management													
Good Running Plant [24b]	.159* (73)	.155* (72)	.272*** (82)	.232** (83)	1.000								
Gives Good Wrk. Conditions[24d]	.209** (74)	.401*** (74)	.442*** (83)	.356*** (84)	.459*** (85)	1.000							
Cares About H & S[25a]	.204** (74)	.216** (73)	.349*** (84)	.310*** (85)	.484*** (85)	.460*** (86)	1.000						
Keeps Dust Down at Work[25g]	.215** (76)	.210** (75)	.505*** (86)	.618*** (87)	.251*** (87)	.513*** (88)	.510*** (89)	1.000					
Joint H & S Committee													
Does a Good Job [25d]	.489*** (73)	.535*** (72)	.692*** (82)	.510*** (82)	.251** (81)	.473*** (83)	.427*** (83)	.467*** (85)	1.000				
Keeps Dust Down at Work [25j]	.343*** (72)	.458*** (72)	.641*** (80)	.513*** (80)	.296*** (79)	.470*** (81)	.505*** (81)	.578*** (83)		1.000			
Workers													
Fellow Workers Keep Dust Down [25i]	.069 (71)	.135 (71)	.314*** (81)	.339*** (82)	.316*** (81)	.206** (83)	.245** (83)	.333*** (85)	.331*** (80)	.404*** (78)	1.000		
Government													
Laws Not Good Enough [25e]	-.074 (64)	-.104 (63)	-.164* (73)	-.046 (72)	.015 (73)	-.165* (75)	-.020 (75)	-.084 (76)	-.050 (73)	-.148 (71)	.094 (72)	1.000	
Inspector Enforces H & S Regs. [25f]	-.078 (65)	-.060 (66)	.240** (71)	.247** (72)	.287*** (73)	.360*** (73)	.310*** (73)	.400*** (75)	.282*** (71)	.228** (70)	.429*** (72)	-.053 (64)	1.000

1. N in parenthesis.
* Significantly different from zero for a two-tail t-test at the .10 level.
** Significant at the .05 level.
*** Significant at the .01 level.

consistent opinion of how well the health and safety responsibility system is working. Satisfied workers tend to respond positively to all actors; whereas dissatisfied workers respond negatively. This does not imply that respondents do not discriminate at all among the parties. The highest correlations found indicate that only about 33% of the variance in one attitude is "explained" by the other attitude. This suggests that attitudes are not entirely consistent.

Table 4.6 summarizes responses to two open-ended questions about public policy. We asked our respondents who should be responsible for health and safety. Although we had expected workers to identify one party, they often identified several. Hence these multiple responses were recorded. The most common response in each plant was "management," cited by 53% from Abex, by 40% from Raybestos, and by 65% from Certified. At Raybestos, where the joint-responsibility system appears to work best, a smaller proportion of workers felt that management should be responsible for health and safety, but relatively larger percentages said that the health and safety committee (20%) or everyone (33%) should be responsible. At Certified, where the system apparently works poorly, 65% said that management should be responsible for health and safety, but only 4% indicated that health and safety is the joint committee's or everyone's responsibility. The Abex and Raybestos results were somewhat dissimilar on other items with greater reference to workers' responsibility at Abex (36% versus 18% at Raybestos) and fewer mentions of government (7% versus 11% at Raybestos) and joint committee (9% at Abex versus 20% at Raybestos).

We were also interested in knowing whether workers perceived any bias or favouritism on the part of government inspectors. About 60% of workers at both Abex and Raybestos agreed that government inspectors care

TABLE 4.6

Summary of Responses to Categorical Questions
About the Health and Safety Responsibility System

Category	Abex		Raybestos		Certified	
	Freq.	%(N)	Freq.	%(N)	Freq.	%(N)
Responsibility for Health and Safety in the Plant:[1]						
Everyone	10	22	15	33	1	4
Union	7	16	6	13	9	35
Workers	16	36*	8	18	4	15
Management	24	53(45)	18	40(45)	17	65(26)
Government	3	7	5	11	2	8
Health and Safety Committee	4	9	9	20	1	4
[26]						
Government Inspectors Care Most About:[1,2]						
Workers	15	60	19	61	1	9
Management	9	36	5	16	6	55
Themselves	4	16(25)	8	26(31)	5	45(11)
Public Interest/ Government	1	4	2	6	0	0
[28]						

1. Multiple responses are possible for open-ended questions.
2. Many respondents had no opinion on this question as they did not know of or had no personal contact with government inspectors.

* χ^2 test for differences in proportions between Abex and Raybestos is significant at the .10 level.

about workers, as compared to 36% and 16% respectively who said inspectors care about management. Respondents at Certified were less positive in their responses: 55% said inspectors care about management, and 45% said inspectors care about themselves, but only one respondent (out of 11) felt inspectors care about workers.

Tables 4.7 through 4.11 summarize the various responses to the final interview question, "Is there anything else that you would like me to tell the Royal Commission?" Most workers interviewed had something specific to say. Many workers gave lengthy answers to this item. The comments were categorized as follows: Dust Levels (Table 4.7); Worker Information and Compensation (Table 4.8); Government Policy and the Royal Commission (Table 4.9); Management (Table 4.10); Union and the Joint Health and Safety Committee (Table 4.11). In reading the comments, one may note variations in opinions on most issues, but the workers nevertheless provide many valuable insights into the nature of the asbestos problem.

The overwhelming comment elicited about dust in the workplace is that levels must be lowered further. According to Table 4.7, 31 respondents expressed this view.[4] The most frequently named cause category for unacceptable dust levels was poor ventilation and inadequate dust collectors on machinery. Even when workers perceived the equipment was adequate, they were concerned with collection systems breaking down or backing-up. Some other specific issues were the need for more comfortable and more effective respirators, and universal provision of showers and coveralls. Many Raybestos workers said they wanted their coveralls cleaned more often than once per week and also a cleaner lunch-room with mandatory washup time before lunch. Finally, six workers expressed concern over exposure to toxic substances other than

TABLE 4.7

Categorized Responses to the Open-Ended "Comments for the Royal Commission" -- Responses Concerning Dust Levels in Plants

Comment	Number of Responses			Variations
	Abex	Raybestos	Certified	
1)Dust levels should be lower; need for clean-up.	11	13	7	
2)Inadequate dust collectors; ventilation	9	9	7	A)General need for improvement of machinery and collectors. B)Problems with dust collectors backing-up and breaking down.
3)Coveralls and shower time are inadequate.	1	13	1	A)Coveralls need to be cleaned more than once a week and the workers should not have to pay for this. B)Coveralls and shower time should be available to all workers.
4)Lunchroom dust conditions need improvement.	2	2	0	A)Lunchroom should be dust-free. B)Need more time to clean up before entering lunchroom.
5)Respirators inadequate.	5	5	1	A)Everyone in the plant should get a mask. B)Masks available do not fit properly; hard to get a true seal.
6)Concern for other chemicals exposed to in production process (lead and formaldehyde).	1	5	0	

Selected Comments

Abex

1. "No matter what dust levels are, there will always be risks. You can never clean up 100%." (2 people)
2. "Surely shovelling asbestos into preforms is out of date. It should be hopper fed and not directly handled by employees." (2)
3. "The guys who complain are the same ones who are afraid to get their fingernails dirty. The lazy guys are the whiners. I'm not afraid to get dirty - I can wash off when I get home."
4. "The company hires students to come into the plant and dust off the pipes. These kids don't know what they are working with."
5. "They are putting on a new roof and dust collected through the years falls on workers from the rafters."

Raybestos

1. "The company can only go so far, then the workers must do something to protect themselves. Perhaps workers should have spot checkers to keep an eye out for careless practices and educate workers to dangers of asbestos exposure."
2. "Workers don't really understand dangers; then the choice of wearing a mask and experiencing discomfort or not wearing one and experiencing less discomfort becomes easier."(2)
3. "The backroom (mixing) and main floor should be separated."
4. "The company uses poor production methods and ancient machines which result in unacceptably high dust levels."
5. "An individual has to be responsible for his own actions. People don't follow rules and they endanger themselves and others."
6. The cleaning of the dust collectors should be the most important job in the factory."
7. "Twelve years ago Dr. Selikoff came to Peterborough and stressed the dangers of working with asbestos. Now here we are today with some improvements but still a hell of a long way to go to adequately protect workers."

Certified

1. "Wearing of masks is not strictly enforced, however the wearing of eye-glasses is. Therefore, workers choose to take off masks when the wearing of both becomes uncomfortable."
2. "The upgrading of the plant has greatly improved the atmosphere."
3. "Things look good but workers don't protect themselves because language difficulties make it hard to communicate the danger."

asbestos. (As we indicated earlier, lead, formaldehyde, and various resins also are used in friction materials production.)

Table 4.8 pertains to information available to workers about asbestos dangers and compensation to victims of asbestos-related illness. These comments were by far the most troubling to our interviewers. Because the number of workers with respiratory problems at any plant is small, the comments were not identified on a plant basis to ensure confidentiality. With regard to the need for information, 22 workers said they needed to know more about asbestos hazards to understand the tradeoff they were making. In particular, some workers suggested that it should be mandatory for information about asbestos hazards to be made available to new employees. The lack of information is particularly apparent for non-English speaking workers at Certified. This problem is presumably present in other firms in Toronto, where Ministry of Labour, management, and even union material is rarely provided in Spanish, Italian, or other major languages spoken by employees.

Ten workers made comments about the medical data (mainly from x-rays) available from the Ministry of Labour and doctors. Some stated that the information provided by the Ministry is unintelligible to most workers regardless of whether they speak English. One interviewer was shown a letter by a very upset individual whose lungs had "diffused interstitial fibrosis indicating chronic changes." The respondent did not understand this jargon and asked our interviewer to explain what this meant. Three workers brought up a related issue: that employee health records were sent without their authorization to a local doctor who was not their personal physician. They felt this was a violation of their right to privacy.

TABLE 4.8

Categorized Responses to the Open-Ended "Comments for the Royal Commission" -- Responses Concerning Information and Compensation for Asbestos Workers

Comment	Number of Responses: Abex	Raybestos	Certified	Variations
1)Workers need to be better educated about asbestos hazards.	5	12	5	A)More information about asbestos hazards need to be given to new employees. B)More education is needed so employee understands the real trade-off he is making.
2)Medical information must be fully disclosed and written in laymen's terms.	4	3	3	A)Test results mailed to worker are in medical jargon. B)Doctors (Company and Government) are reluctant to say what caused workers illnesses. C)Results of chest x-rays should be sent directly to workers
3)Need for compulsory retirement with adequate pension after so many years in asbestos industry.	5	6	0	A)Compulsory retirement between 20-30 years of work. B)Retirement with liveable pension.
4)Need better pension compensation for asbestos victims.	4	4	4	A)Compulsory retirement and and adequate compensation for asbestosis victim and his family after he dies. B)Too much red tape to obtain compensation for asbestos related illness.
5)Wages should increase because of the risks asbestos workers must take.	3	0	2	

Selected Comments - Plant Unidentified to Maintain Confidentiality

1. "We cannot understand hazards because of language problem. They should give us training courses in our own language."
2. "The Workmen's Compensation Board, the Company and the Ministry of Labour don't care if workers know about their health problems."
3. "Penalties should be imposed on members of the medical profession who ignore the realities of asbestos-related or induced sicknesses."
4. "I don't know what is happening to me and who can help me." The respondent handed the interviewer a letter from the Ministry of Labour which stated that the respondent had "diffused interstitial fibrosis indicating chronic changes." The respondent did not know what this meant.
5. "A committee of government representatives and workers from all asbestos plants should be set up so that problems are aired and standards are consistently enforced."
6. "I asked a doctor from the government peek-a-boo committee about asbestos. He told me not to worry because the plant never had dust counts over the legal limit."
7. "The Ministry of Labour found scars on my lungs. They said they could of been caused by pneumonia. I wish they could tell me whether or not they were from asbestos exposure."
8. "I don't understand how they do dust readings but the Company says they are well within the limit."
9. "There should be something in the contract concerning asbestos hazards. Workers should know about the risks they are taking."
10. "Why does it take so long to get results of tests?"
11. "Copies of employee health records were sent to a local doctor without employee authorization. This is a violation of confidence."(3)
12. "The risks we take are the price of modern convenience and we should be compensated for the cost to our health."
13. "There must be a better way to compensate asbestos victims. After all, they don't live long."
14. "I have no choice but to work for Abex. There should be a plan for 25 years and out with full pension."
15. "If you are allowed to work with a hazardous substance, programs should be set up to provide early and adequate pensions."

Eleven workers at Abex and Raybestos asked the Commission to consider mandatory retirement after 20 to 30 years with an adequate pension for all asbestos workers as compensation for the health risks which they have been subjected to (which were no doubt greater a decade ago than they are today). Another twelve respondents mentioned the difficulty associated with asbestos-related Workers' Compensation Board claims.

The statements regarding public policy and the Royal Commission are in Table 4.9. The most frequent comment regarding public policy was a request for the Ontario government to implement stricter legislation to improve health and safety conditions. Some areas where standards could be improved were mentioned earlier (i.e., better dust collectors, better respirators, shower facilities). Although few workers knew about control limits for dust, there is ample evidence that the friction material plants could work with an exposure limit of 1 fibre/cc, with the exception that any areas with higher readings could be enclosed and respirators should be required.

Regarding the current system, about a dozen respondents expressed displeasure with government inspectors. Inspections do not include evening shifts, and some workers believe that management receives a warning of inspectors' visits allowing management time to clean up. The cynicism of many comments is consistent with the relatively negative attitude scores for inspectors (on a par with management).

Finally, there were roughly an equal number of respondents optimistic or pessimistic about the likelihood that the Royal Commission would improve their worklives.

Comments about management are contained in Table 4.10. Twelve workers stated that management does not care about worker health and

TABLE 4.9

Categorized Responses to the Open-Ended "Comments for the Royal Commission" -- Responses Concerning Government Policy and Royal Commission Specifically

Comments	Number of Responses		
	Abex	Raybestos	Certified
Government inspectors should come more frequently and/or to all shifts.	3	5	1
Government inspections are not really unannounced (management knows).	0	2	2
Government should implement stricter legislation to improve health and safety conditions.	6	11	6
Government should subsidize company to improve health and safety conditions.	1	4	0
Cynical about the Royal Commission on Asbestos	2	2	2
Optimistic about the Royal Commission on Asbestos	1	2	2

Selected Comments About Government

Abex

1. "Management and Union let things slide. We need the government to come in and enforce clean-up. Once the money is spent right, we won't have to do it again."
2. "The government should keep statistics on H & S of all asbestos workers and publish a 'symptoms' pamphlet."
3. "What about workers in Quebec if asbestos is banned?" (2)
4. "Inspectors should come on all shifts not just the day shift. The night shift is when all the messy work is done."
5. "We are not allowed to talk to inspectors."

Raybestos

1. "The Company always knows when the inspectors are coming. They shut down certain machines. Most of the inspectors don't know what to look for. They should all come up through the ranks of labour."
2. "The government is pretty quick to point the finger and make laws but then they leave it to the Company to find out how to get levels down. They should help research better equipment."
3. "The government must keep pressure on companies if anything is to improve." (3)
4. "Inspectors are a joke. They never stop to talk to the workers."
5. "Inspectors try to keep both union and management happy. This is a difficult balance and often it is the worker who gets hurt."
6. "When inspectors come, management shuts down the problem machinery. Sometimes they inspect at lunch time when all machinery is shut down."
7. "Inspectors do not follow up on corrections requested. They give a very flexible time requirement." (2)
8. "The government should not ban asbestos but educate people. They could spend money on commercials to educate workers."

TABLE 4.9 (continued)

Certified

1. "If the government is not going to enforce regulations they should give workers the power to protect themselves."
2. "When government inspectors are about to visit the plant the management cleans up.
3. "Truly on-the-spot inspections are needed. Everyone knows two hours before they ar coming. They are in the pockets of management."
4. "Asbestos should be banned and the government should force substitutes on to the market."

Comments About the Royal Commission
Abex

1. "What good will this study do? Workers have different opinions with duration of work, after time you learn to accept conditions."
2. "I'm happy to see something is being done to investigate the problem."
3. "Look at all this concern about schools. The danger to workers is far greater and nobody cares."

Raybestos

1. "Have the directors of the Royal Commission ever been in an asbestos plant? Do they really know what we do."
2. "I would like to know what the Royal Commission is planning. We need more information."
3. "Is this going to be like all royal commissions, spending millions and going nowhere
4. "The Commission must remember that health comes first in all the decisions they make

Certified

1. "I hope that enough people are contacted so we get a picture of how the real story is."
2. "The Royal Commission has no real power. It can only recommend and then it is left to the government to legislate or not to legislate."
3. "The Royal Commission should come down to the plant when it is going full force and see the hazards for themselves."
4. "I hope the Commission is practical and really accomplishes something. Ban asbestos if necessary but make sure workers jobs are protected."

TABLE 4.10

Categorized Responses to the Open-Ended "Comments for the Royal Commission" -- Responses Concerning Management

Comments	Number of Responses		
	Abex	Raybestos	Certified
Company does not care about worker health and safety.	3	7	2
Company cares about safety but not health.	2	4	0
Company is doing good job.	3	2	1

Selected Comments

Abex

1. "Management does not listen to workers' suggestions."
2. "Abex is big on safety, but won't part with big bucks needed to bring down dust levels."
3. "Management is doing the best they can."
4. "The Company should get qualified supervision."

Raybestos

1. "I tested the foreman the other night. I should have been wearing my mask and he said nothing."
2. "The Company is quick to correct safety problems because that means loss of work time. But they don't really care about worker health."
3. "The Company can make the plant a lot safer with the money they are not paying me."
4. "Since I've been here management has been pushing health and safety."
5. "No company will do more than the law makes them do. If that."
6. "The Company is not really educated on Bill 70. They should realize better working conditions will be good for operations in the long-run."
7. "Raybestos is an American company. They have moved their dirtiest jobs to Canada. They don't care about the Canadian workers because no one forces them to care."
8. "The Company should be financially penalized for violating dust level standards."

Certified

1. "Two workers that were in pretty bad shape, both with serious asbestosis, were bought tickets to fly back to their country of origin. The bosses didn't want them to die around here."
2. "The Company tells us we can quit if we don't like it. But a lot of people at the plant are on work visas and they can't quit because if they have no job they will lose their work permits. The Company knows this."
3. "The Company should treat workers like human beings."
4. "It is easy for management to say workers don't care but management wants to keep awareness level low because they don't want health and safety problems such as a work stoppage."

TABLE 4.11

Categorized Responses to the Open-Ended "Comments for the Royal Commission" -- Responses Concerning the Union and the Joint Health and Safety Committee

Selected Comments About the Union

Abex

1. "Changes only happen when the union gets the government to pressure management."

Raybestos

1. "People in the union have initiated the improvements in working conditions."
2. "On our last contract the union could not press for improvements in health and safety conditions because the management gave us an ultimatum. They said they were going to close either this plant or one in Crawfordville so we better be good." (4)
3. "Sometimes unions use Bill 70 for political pressure during collective bargaining. I wonder sometimes, if they really care."
4. "The union here is very competent."

Certified

1. "Union goes along with management."
2. "Neither union nor management really care about worker health and safety."

Selected Comments About the Joint Health and Safety Committee

Abex

1. "The Health and Safety Committee worker representatives are only around on the day shift and all the messy work is done at night."

Raybestos

1. "The Health and Safety Committee is dominated by management. Worker representatives are not given enough power from a legal point of view. They need the power to call in inspectors immediately."
2. "The Health and Safety Committee is doing a great job within the limits that the law allows."
3. "Representatives on the Health and Safety Committee should be given formal training."
4. "There should be general Health and Safety meetings for workers more often."

safety; six stated that management cares about safety but not health; and six stated that management is doing a good job.

Table 4.11 lists selected comments about the union and the joint health and safety committee. No categorization was attempted here due to the diversity of responses. While generalizations are impossible, individual comments by Certified employees about the management and union were uniformly negative, consistent with their negative attitude scores for all parties.

Perceptions of Risk in the Work Environment

Workers perceive risk from asbestos exposure in various ways; thus we tried to tap a variety of attitudes and perceptions related to the risks involved in their work. A most obvious and direct source of perceived risk is knowledge of dust-related illnesses in oneself or others. These data are discussed first below and are followed by a discussion of workers' attitudes toward the efficacy of the health and safety protections.

Knowledge of Dust-Related Illnesses

Awareness of dust-related diseases in oneself or others may be a potent factor in affecting one's attitudes toward occupational health. At Abex and Raybestos combined, 11 workers reported that they definitely had what they believed to be a dust-related illness, and another 7 reported that they may have one. These 18 respondents are 20% of the

sample from the two plants.[5] They did not report any cancer, emphysema, or asbestosis, but all 17 did report a variety of chronic respiratory problems ranging from bronchitis to frequently occurring lingering colds and influenza. These respondents felt that dust prolonged these illnesses or made them more susceptible to these infections (see Table 4.12).

At Certified, 5 of 26 respondents or 19% reported a dust-related disease. We recorded these 5 in the "other" respiratory disease category; although, in one case, the translation was unclear, and the respondent may have reported asbestosis.

The proportions of self-reported diseases and illnesses cannot be treated as accurate representations of actual illnesses because self-reports are subject to a number of possible distortions: illnesses will not be reported by respondents who did not know or did not wish us to know they had certain diseases, nor will they be reported by respondents who had relevant illnesses but did not believe they were dust-related. On the other hand, respondents may report illnesses which they believe they have, but which they do not actually have. Nevertheless, it is quite possible that our respondents' reports are reasonably accurate, and should not be dismissed without further investigation. Several respondents asked if they were being interviewed because they had asbestosis. They were puzzled because of a letter which they had received from the government suggesting they see a doctor regarding the results of a chest X-ray. From such comments, it seems likely that plant, community, and/or Ministry of Labour medical authorities have not explained such medical recommendations and reports adequately. There is apparently a need for more intelligible advice to employees. In this vein, some workers expressed concerns that their personal physician was

TABLE 4.12

Summary of Questionnaire Responses Concerning
Knowledge of Own and Other Workers'
Dust-Related Illnesses

Knowledge of Illness	Abex		Raybestos		Certified	
	Freq.	% (N)	Freq.	% (N)	Freq.	% (N)
No. of Other Workers Known with Dust-Related Illness:***						
0	19	44	16	36	5	31
1	15	35	8	18	3	19
2	6	14(43)	3	7(45)	1	6(16)
3+	3	7	18	40	7	44
[37]						
Others' Asbestosis*	22	92(24)	19	68(28)	5	46(11)
Others' Cancer	4	17(24)	6	21(28)	1	9(11)
Others with Other Respiratory Illness	7	29(24)	11	39(28)	3	27(11)
[37a]						
Have You Been Ill Because of Dust?**						
No	34	77	37	82	21	81
Maybe	1	2(44)	6	13(45)	0	0(26)
Yes	9	20	2	4	5	19
[38]						
Self-Asbestosis[1]	0	0(10)	0	0(6)	0	0(5)
Self-Cancer	0	0(10)	0	0(6)	0	0(5)
Self-Other	10	100(10)	6	100(6)	5	100(5)
[38a]						

1. One of these respondents showed our interviewer a letter which the respondent did not understand. The letter indicated the respondent had "diffused interstitial fibrosis indicating chronic changes."

* χ^2 test for differences in proportions between Abex and Raybestos is significant at the .10 level.

** Significant at .05 level.

*** Significant at .01 level.

also the company doctor. This is the greatest problem in Lindsay where there are few doctors for workers to select from.

We also asked respondents whether they knew of others at the plant "who are or were sick because of dust at work." Workers were asked to name the illness for each person they knew. We were surprised in several ways with the Raybestos/Abex comparisons. There were significantly different proportions of respondents in the two plants (see Table 4.12) who knew about illnesses in others. Fewer Raybestos (36%) than Abex (44%) employees knew no one with dust-related illnesses; indeed about 40% of Raybestos respondents knew of three or more people with dust-related illnesses, as compared to only 7% for Abex.

A number of factors may affect workers' knowledge of illnesses. Longer service and/or a larger workforce may enhance the probability of knowing someone with a dust-related illness. Being in a smaller community where most residents are well-known may affect this knowledge. It is also likely that the illness of a very popular person may be better known throughout the plant than the illness of a less popular employee. Finally, an active union may strive to make employees aware of hazards through discussions of other employees' illnesses. In the case of Abex and Raybestos, it is not possible to know for certain which of these factors, if any, is directly responsible for the differences we found. In the correlational data presented in Chapter 5 associations among some of these factors are shown. However, differences associated wholly with the plants are confounded with community size, size of workforce in the plant, and union characteristics for each plant. There is no way to know whether one of these, some of these, and/or other unidentified factors have caused the differences between the plants.

There were no differences among plants for three broad types of

illnesses reported. Of the 91 respondents in Raybestos and Abex combined, 45% knew at least one fellow worker who now had, or who had died of, asbestosis. There were 11% who knew of at least one person with cancer, and 20% who knew of someone with another respiratory disease.

At Certified, the number of known illnesses in others was similar to Raybestos. Only 31% knew of no one with dust-related illnesses, and 44% knew of three or more people. Of all Certified respondents, 5 or 19% knew of at least one asbestosis victim, 1 or 4% knew of a cancer victim, and 3 or 12% knew someone with other respiratory diseases.

Both the reports of others' and the respondents' own dust-related illnesses were given in response to open-ended questions. Thus the illnesses "volunteered" were not suggested to respondents by the wording of the question although the question necessarily implied that some illnesses were caused by dust exposure. We therefore feel that these questions rather conservatively tapped the associations which respondents have made between dust and their own or others' illnesses.

Perceptions of Risk: Attitudes

Workers were asked to indicate their agreement with a variety of statements about standards and equipment. Workers were divided at all plants on whether a safe dust level could be set (see Table 4.13). Averages of 2.54, 2.71, and 3.11 at Abex, Raybestos, and Certified respectively show a slight agreement at the first two plants and a neutral score at the third. Workers from all three plants slightly disagreed (averages from 3.4 to 3.7) that their safety clothing and equipment protects them from all hazards. Workers at Raybestos were in greater agreement that

TABLE 4.13

Descriptive Statistics for Attitudes
Concerning Perceptions of Asbestos Risk

Variable	Abex Mean	Abex SD(N)	Raybestos Mean	Raybestos SD(N)	Certified Mean	Certified SD(N)
Safe dust level[1] can be set[29a]	2.54	1.68(37)	2.71	1.68(41)	3.11	1.91(19)
Safety clothing and equipment protects[29d]	3.67	1.51(39)	3.44	1.52(43)	3.71	1.68(24)
Air system dust levels safe[29e]	3.26	1.45(43)**	2.63	1.37(40)	3.40	1.61(25)
Can tell dust levels[29f]	2.58	1.46(36)	2.55	1.61(31)	1.88	1.26(24)
Conditions improved since August 1980[30]	2.23	0.73(40)	2.40	1.12(43)	2.54	.14(26)
Would tell family member to work at plant[29h]	Freq.	%(N)	Freq.	%(N)	Freq.	%(N)
Yes	17	41	16	36	4	8
Maybe	2	5(42)	2	5(44)	0	0(26)
No	23	55	26	59	22	92

1. A score of 1 indicates strong agreement, 3 neutrality, and 5 strong disagreement.

** Significant difference between means at Abex and Paybestos for a two-tail t-test at .05 level.

their dust collection system protected them than were workers at Abex. The means were significantly different on this item. Certified workers' ratings were close to those at Abex. New dust collectors were being installed at Raybestos because of the plant expansion, but we do not know whether one plant objectively offered better protection than the other. Workers at all three plants tended to agree that they could tell when dust levels were higher than usual; the average ratings were 2.6 at Abex and Raybestos, and 1.9 at Certified. Respondents indicated that they noticed the stronger odours and/or their glasses becoming dirty more quickly when dust levels were high. One official told us that workers sometimes confuse discomfort caused by high levels of heat and humidity in the plant with discomfort caused by high dust levels. In both situations, breathing with a respirator becomes increasingly difficult and uncomfortable. An accumulation of dust on one's eyeglasses, however, would appear to be a clear sign of dust accumulation and should not lend itself to confusion with other uncomfortable plant conditions.

When asked whether health and safety conditions had improved in the last year, workers at all three plants slightly agreed. Sources of changed conditions are shown in Table 4.14. Of those indicating a change in conditions at Raybestos, 7% attributed the plant expansion as a cause of improvement and 75% as a cause of worsened conditions. The union was seen as a cause of improved conditions at Abex (42%), Raybestos (33%), and Certified (80%). The joint health and safety committee was seen as causing only slightly less improvement; management slightly less than the joint committee; government and individuals were considerably less frequently cited. Management was mentioned by only one employee as a cause of worsened conditions.

Finally, workers were asked whether they would recommend that a

TABLE 4.14

Sources of Changed Health and Safety Conditions

Source of Change[30]	Abex		Raybestos		Certified	
	Freq.	% (N)	Freq.	% (N)	Freq.	% (N)
Plant Expansion						
Improved	0	0(26)	2	7(27)	0	0(5)
Worsened	0	0(1)	6	75(8)	0	0(0)
Union						
Improved	11	42(26)	9	33(27)	4	80(5)
Management						
Improved	8	31(26)	7	26(27)	2	40(5)
Worsened	0	0(1)	1	13(8)	0	0(0)
H&S Committee						
Improved	9	35(26)	10	37(27)	0	0(5)
Individual Workers						
Improved	2	8(26)	0	0(27)	0	0(5)
Government						
Improved	3	12(26)	8	30(27)	0	0(5)

TABLE 4.15

Correlation Coefficients Among Attitude Variables Concerning Perceptions of Asbestos Risk (Abex and Raybestos Combined)

Variable	29a	29d	29e	29f	30
Safe level can be set [29a]	1.000				
Safety clothing equipment protects [29d]	.146 (73)[1]	1.000			
Air system dust levels safe [29e]	.322** (71)	.402*** (76)	1.000		
Can tell unsafe dust levels [29f]	.268** (59)	-.079 (63)	.077 (64)	1.000	
Conditions improved since August 1980 [30]	-.030 (72)	.234** (75)	.132 (76)	-.015 (63)	1.000

1. N in parenthesis.
* Significantly different from zero for a two-tail t-test at the .10 level.
** Significant at the .05 level.
*** Significant at the .01 level.

family member take a job at the plant. This was designed as a scaled attitude statement, but because so many workers tended to answer yes, no, or maybe, we coded their responses in this manner. A small majority of respondents at Abex (55%) and Raybestos (59%) did not want a family member to work at their plant, but most of Certified respondents (92%) would not recommend their plant to family members. Our respondents also frequently qualified their answers with comments, presumably because they felt the rationale for their answers was important; however, we did not systematically record these latter comments.

Correlations among the attitude items on perceptions of risk are shown in Table 4.15. Again attitudes were somewhat consistent. Workers who agreed (or disagreed) that a safe dust level could be set were likely to respond similarly to statements about the air system's effectiveness and their ability to detect high dust levels. Agreement (or disagreement) regarding the air system's effectiveness was associated with similar responses regarding the effectiveness of safety clothing and equipment. As well, greater agreement regarding the air system was associated with a greater belief in the improvement of the health and safety conditions at work; whereas disagreement was associated with a perceived worsening of health and safety conditions.

Knowledge of Rights and Protections

Workers' knowledge of rights and protections regarding health and safety was largely gathered from responses to open-ended questions (see Table 4.16). We began our assessment of this knowledge by asking workers to name a health and safety committee representative who worked on their

TABLE 4.16

Descriptive Statistics for Questions Concerning Workers' Knowledge of Rights and Protections

Variable	Abex Freq.	Abex % (N)	Raybestos Freq.	Raybestos % (N)	Certified Freq.	Certified % (N)
Knows H&S Representative** [19a]	36	80(45)	27	59(46)	2	9(23)
Talked to previously about H & S						
Boss	24	53(45)	22	49(45)	6	23(26)
Union	23	51(45)	23	50(46)	8	33(24)
Government Inspector [33,34,35]	6	13(45)	4	9(45)	3	12(26)
Talked to person about dust hazards						
Boss	21	88(24)	18	82(22)	6	100(6)
Union	21	91(23)	16	70(23)	7	88(8)
Government Inspector [33,34,35]	6	100(6)	3	75(4)	3	100(3)
Person on H&S committee						
Boss	5	21(24)	4	18(22)	0	0(6)
Union [33,34]	15	65(23)	10	43(23)	3	38(8)
Access to dust tests***						
Never tried	35	78	18	40	16	67
Tried: refused or never received	6	13(45)	6	13(45)	3	13(24)
Received or knows available [36]	4	9	21	47	5	21
Extra danger since January 1						
No	36	80	30	65	22	88
Yes, dust	9	20(45)	8	17(46)	3	12(25)
Yes, other [39]	0	0	8	17	0	0

TABLE 4.16(Continued)

Variable	Abex Freq.	Abex % (N)	Raybestos Freq.	Raybestos % (N)	Certified Freq.	Certified % (N)
Responses to extra danger						
Refused to work	2	22	4	25	2	67
Told foreman	4	44	3	19	0	0
Told union	1	11(9)	0	0(16)	0	0(3)
Told H&S committee	2	22	1	6	0	0
Told fellow workers [39]	0	0	1	6	0	0
Responses to future danger						
Refuse to work	19	43	21	49	6	25
Tell foreman	16	36	22	51	11	46
Tell union	9	20(44)	8	19(43)	2	8(24)
Tell H & S committee	12	27	12	28	2	8
Tell fellow workers [40]	0	0	0	0	1	4

	Abex Mean	Abex SD(N)	Raybestos Mean	Raybestos SD(N)	Certified Mean	Certified SD(N)
Can Refuse Unsafe Work Without Penalty [29b]	1.90	1.28(40)	1.52	1.02(42)	3.00	1.65(20)
Number of Inspector Visits Known About [27]	1.38	1.48(42)*	.82	1.32(44)	.81	1.17(26)

* Significant difference between means at Abex and Raybestos for a two-tail t-test at the .10 level.

** χ^2 test for differences in variance between Abex and Raybestos is significant at the .05 level.

*** χ^2 test significant at the .01 level.

shift. We determined from a list of representatives from each plant whether the names given were correct. The most striking finding here was that 80% of Abex and 59% of Raybestos respondents knew their representatives by name,but only 9% of those from Certified knew theirs. Given that our sample at Certified over-represented both the English-speaking employees, and the non-English speakers who were willing to be involved with "officialdom," the 9% figure probably overestimates the proportions of Certified employees who know their representatives by name. At both Abex and Raybestos, about half of the respondents had discussed health and safety problems with both union and management officials, but the figures were lower, 23% and 33% respectively, at Certified. About 10% of respondents at all plants reported discussing health and safety issues with a government inspector. As some employees did not discriminate between government inspectors and people hired by the company to do dust tests, we cannot be certain whether respondents actually spoke with an inspector.

Access to dust test results has often been a contentious issue for workers in asbestos industries. We wanted to know whether workers had tried to obtain the test results and whether they were successful in the attempt. Proportions of workers who had never tried to see dust test results were highest at Abex (78%), next highest at Certified (67%), but considerably lower at Raybestos (40%). About 13% of respondents at each plant said they were unsuccessful (i.e., they were refused or never saw the results). About 9% of respondents at Abex, 21% at Certified, and 47% at Raybestos reported that they had seen test results or knew they were available. A small subset of these respondents who had seen test results, 4% at Paybestos and 8% at Certified, told us voluntarily that they did not understand the test results although they knew the results

were available. Since we did not systematically ask such respondents if they could understand the results, we do not know the number of other workers who may also have had difficulty understanding the results.

The different proportions of employees at Abex and Raybestos in the three categories outlined above were statistically significant due to the higher proportions at Abex never seeking out test results and the higher proportions at Raybestos who did. This reflects, in our opinion, the greater concern and involvement of the union at Raybestos in health and safety matters. Some union officials from Raybestos told us that they often encouraged workers to ask for (and not accept a refusal of) the results of various health-related tests done in the plant.

We were also interested in the numbers of workers who perceived that they had faced dangerous work since January 1, 1981, and what action they had taken. When we asked these workers about dangers at work, some workers replied that their work was always dangerous. In these cases, we indicated that we meant extraordinary dangers. At Abex 80% and at Certified 88% of workers reported no (extra) dangers, but at Raybestos only 65% reported no dangers. At Abex all dangers (20%) were reported to be dust-related as they were at Certified (12%). At Raybestos half (17%) were related to dust and half to other issues such as the safety of machinery. The workers who reported they had faced a danger were then asked what they did in response to the danger. Their answers were coded according to the type of actions which they took (e.g., refusal to work). Some workers mentioned only one action; some mentioned several (e.g., told foreman, then refused to work); some did nothing. Our interest here was what the workers actually did in response to perceived danger. We also asked workers what they would do if faced with dangerous dust levels at work the next day. We were interested in comparing what

some workers had actually done in response to danger with what all the workers perceived they could do. About one-fourth of Abex (22%) and Raybestos (25%) workers who had been in danger reported that they refused to work, but just under half of all respondents (43% at Abex, 49% at Raybestos) stated that they would refuse dangerous work in the future. Two of the three workers who faced danger at Certified refused work, but only 25% of all respondents from Certified said they would refuse dangerous work tomorrow. At Abex, 44% of workers reported their dangerous situation to the foreman; at Raybestos 19%; but none at Certified did this. Telling the foreman in the event of future dangers was the most frequently cited action at Raybestos (51%) and Certified (46%), but was less frequently cited at Abex (36%) than refusal to work.

In response to the attitude statement that workers could refuse unsafe work, about 83% at Abex, 90% at Raybestos, and 40% at Certified agreed. Thus, although workers knew of this right in one context, only about half the proportion knowing of the right stated that they would refuse to work if faced with dangerous dust levels tomorrow. In the cases of Abex and Raybestos, even smaller proportions actually reported refusing dangerous work since January 1, 1981. This suggests that while workers may know their rights they will not necessarily exercise them.

We do not know why there is this contrast between the hypothetical and actual exercise of rights. Workers may foresee difficulties in exercising rights, or the refusal to work may not be perceived as a particularly useful response to dangerous dust levels. Some respondents commented to us that they are told to wear respirators when dust collectors break down. A refusal to work may thus only be perceived as an interim response to an unsafe work environment which can be made safe enough with the use of respirators.

One final area where workers have some knowledge of protections is their knowledge of visits by health and safety inspectors. On the average, there were few visits known about since January 1, 1981. The average was about 0.8 at Raybestos and Certified, and 1.4 at Abex. Since some workers asked our interviewers whether the people who did the dust tests were inspectors, we were concerned about the accuracy of the perceptions of inspector visits.[6]

Tradeoff Items

Table 4.17 presents descriptive statistics for the final set of variables: items concerning implicit or explicit tradeoffs between asbestos risk and income (or job security).

Regarding tradeoffs, we asked employees how much overtime they would like to work each month. At this level of analysis, the desired overtime per month represents a straightforward trade of extra hours of asbestos exposure for the premium wage rate. (Time-and-a-half pay for overtime represents $10.50 per hour for an employee who normally receives $7.00 per hour.) On average, workers in all plants wanted to work extra hours under those terms. At Abex, workers wanted to work 10 hours per month, at Raybestos 13 hours, and at Certified 9 hours. Nonetheless, within each plant there was substantial variation in responses from those who wanted to work no extra overtime to those who said "all I can get" (which we coded at 40 hours/month, the most overtime anyone actually worked at a plant).

Workers at Abex and Raybestos were generally uncertain whether there would be a tradeoff between stricter asbestos regulations and

TABLE 4.17

Descriptive Statistics for Ordinal Responses Concerning Tradeoffs

Variable	Abex				Raybestos				Certified			
			Mean	SD(N)			Mean	SD(N)			Mean	SD(N)
Desired overtime hours per month [15]			10.1	14.5(42)			13.2	14.5(42)			9.04	13.1(26)
Tougher regulations mean job loss [29c]			3.13	1.61(38)			2.89	1.57(38)			3.83	1.66(24)
Give up wages to remove asbestos danger [29g]			3.82	1.57(39)			3.30	1.68(37)			3.84	1.68(25)
Bargaining Issue Rankings [23]2	Freq.	%	Mean	SD(N)	Freq.	%	Mean	SD(N)	Freq.	%	Mean	SD(N)
Wages/COLA	40	88	4.16	1.58	36	82	3.89	1.97	21	81	3.73	1.91
Health & Safety	23	51	1.91	1.98	17	39	1.39	1.87	15	58	2.50	2.25
Pension	14	31	1.38	2.10	12	27	1.02	1.78	2	8	.31	1.09
Fringe Benefits	17	38	1.42	1.89(45)	15	33	1.27	1.87(44)	5	19	.77	1.63(26)
Job Security	0	0	.00	.00	4	9	.36	1.18	3	12	.54	1.53
Other Non-Monetary Issues	1	2	.11	.75	5	11	.25	.72	2	8	.35	1.23

1. A score of 1 indicates strong agreement, 3 neutrality and 5 strong disagreement.
2. A score of 5 indicates issue is most important, 4 second most important, etc. A score of 0 is assigned if the issue was not mentioned by the respondent.

employment; the mean scores on the item (29c) were 2.89 and 3.13 respectively with a score of 3 being neutral. Certified respondents disagreed with the existence of a tradeoff; the average score was 3.83.

When the tradeoff was framed in more personal terms (29g): "I would give up wages to be completely free of asbestos dangers," workers were much more certain. Respondents at Abex, Certified, and, to a slightly lesser extent, at Raybestos disagreed with the statement; the average scores were 3.82, 3.84, and 3.30 respectively. We will pursue these responses further when Table 4.18 is discussed.

Rankings of collective bargaining issues also shown in Table 4.17 indicate the primacy of wages in the minds of most workers. Over 80% of respondents in each plant mentioned wages and/or a COLA clause as an important issue to them. Using a coding scheme of 5 for the most important issue mentioned, 4 for second most important, 3 for third most important, etc., with 0 coded when the issue is not mentioned, wage/COLA is by far the most important issue with average ranks of 4.16, 3.89, and 3.73 for Abex, Raybestos, and Certified respondents respectively.

Health and safety was rated the second most important issue by workers at all three plants, ranked above pensions, fringe benefits, job security, and other non-monetary issues. Over 50% of Certified and Abex respondents and 40% of the Raybestos respondents mentioned the issue. Nonetheless, the average rankings of 1.4 to 2.5 for health and safety indicate that this issue is not even a close second to wages in importance to most workers. This result suggests that workers may be willing to trade other benefits for health and safety, but it is unlikely that wages would be traded off.

Table 4.18 reaffirms the previous statements about wages. After respondents expressed agreement with the statement about trading wages

TABLE 4.18

Summary of Responses to the
Percentage Wage Which Workers Would Forego
to Remove Asbestos Danger

Percent Wage Foregone [1]	Abex		Raybestos		Certified	
	Freq.	%(N)	Freq.	%(N)	Freq.	%(N)
0%[2]	21	84	9	47	15	68
1 - 3 %	1	4	2	11	3	15
4 - 5%	1	4	4	21	0	0
10%	0	0(25)	3	16(19)	2	9(22)
15%	2	8	0	0	0	0
20%	0	0	0	0%	1	5
Mean	1.48		3.68		3.18	
SD	4.20		5.40		6.95	

1. Nine respondents who were willing to trade wages for safety were uncertain as to how much.
2. Eighteen of the 45 respondents who would not give up any income, volunteered that they simply could not afford to.

for complete safety from asbestos (29g), they were asked what percent of wages they would forego. (Workers who disagreed with the item are, in effect, saying they would not give up any wages.) The overwhelming majority of those who did respond to this item were unwilling to give up anything (84% at Abex, 47% at Raybestos, and 68% at Certified). There is reason to believe that these responses do not stem from a lack of concern about asbestos danger. Eighteen of the 45 respondents who would not give up any income told the interviewers that they had too much difficulty providing for their families (or themselves) to consider the issue although they had agreed in principle with the item. Among those 19 workers who would be willing to give up wages, only 8 respondents would consider giving up more than 5% of their wages.

Table 4.19 summarizes responses to the lengthy question based on the recommendation that asbestos be banned by 1985. At Abex and Raybestos, workers were also told that asbestos substitutes exist but would increase the cost of brake linings by 20%. At Abex 62% of the respondents and at Raybestos 56% felt that, on balance, the ban was a good idea. Virtually every respondent from Certified agreed with the ban, but the clause containing an estimate of increased costs was not read to these respondents (because of management's objections). By far the most frequent reason given in favour of the ban was that asbestos constituted a health danger. A few workers stated that the existence of safe substitutes made the ban feasible, and two respondents commented on the attendant environmental benefits of such a ban.

Among the substantial minority opposed to the ban (about 40% at Abex and Raybestos), two reasons were generally cited. The most common concern was that there would be a decrease in demand for Ontario-made brake linings due to the increased cost. This decreased demand would

TABLE 4.19

Summary of Responses to the Proposal that Asbestos be Banned by 1985

Is the Proposal a Good Idea?[32]	Abex		Raybestos		Certified	
	Freq.	%(N)	Freq.	%(N)	Freq.	%(N)
Yes	23	62(37)	24	56(43)	22	96(23)
No	14	38	19	44	1	4
If Yes:						
Asbestos is a health danger	18	78	21	91	16	100
There are safe subsitutes	5	22(23)	1	4(24)	0	0(22)
Will reduce environmental pollution	2	9	0	0	0	0
If No:						
No safe substitutes/ fibreglass no better	6	43	5	26	1	100
Costly; may lose job	8	57(14)	9	47(19)	1	100(1)
Asbestos unavoidable for fire protections	1	7	1	5	0	0

eventually lead to job losses. About 33% of Abex and Raybestos respondents who were against the ban believed that available substitutes for asbestos (e.g., fibreglass) were also hazardous to their health.

Simple correlations have been estimated for the combined Abex and Raybestos sample to check for consistency among responses to tradeoff variables. The most noteworthy feature of Table 4.20 is the paucity of significant correlations. Two attitudinal statements were completely uncorrelated: people who agreed that tougher asbestos regulations would mean job losses were no less willing to trade wages for removal of asbestos risk than those who disagreed. Indeed the perceived effects of tougher laws (29c) were virtually uncorrelated with all other tradeoff variables.

The willingness to give up wages (29g) was significantly negatively related to the health and safety bargaining rank (23 - H&S). This indicated that the more strongly a person agreed with foregoing income in return for reduced danger, the greater was the importance the person attached to health and safety as a collective bargaining issue. In addition, workers who ranked health and safety highly preferred working less overtime. This significant correlation is reassuring because the overtime and bargaining issue questions were asked early in the interview before any explicit suggestion of tradeoffs was made. This consistency of opinion suggests that we have not altered respondents' opinions by our interview procedure. Finally, the willingness to give up wages for less danger (29g) was highly correlated (-.73) with the percentage wage one would forego to avoid danger. Though this relationship is largely definitional, it again suggests that respondents were answering consistently.

Opinions about the value of an asbestos ban (32) were not

TABLE 4.20

Correlation Coefficients Among Tradeoff Variables (Abex and Raybestos Combined)

ariable	15	29c	29g	32	23-WAGE	23-H&S
esired Overtime 15]	1.00					
ougher regs. mean ob loss [29c]	.044 (70)	1.00				
ive up wages to remove sbestos danger [29g]	.127 (71)	.065 (63)	1.00			
s asbestos ban a good dea?[32]1	-.026 (74)	-.023 (68)	.100 (69)	1.00		
ages/COLA as bargaining ssue [23-WAGE]	.133 (82)	.064 (74)	.031 (74)	-.018 (78)	1.00	
ealth and safety as argaining issue [23-H&S]	-.229** (82)	.006 (74)	-.238** (74)	.094 (78)	-.004 (89)	1.00
hat % of wage would you ive up to remove sbestos danger	-.092 (41)	.019 (40)	-.729*** (43)	.157 (38)	-.235* (44)	.178 (44)

. Yes = 1; No = 0.
Significantly different from zero for a two-tail t-test at the .10 level.
* Significant at the .05 level.
** Significant at the .01 level.

significantly associated with other variables, although the question has the expected sign in its correlations with 29g and the percent wage foregone. Perhaps the complexity of this question led to inconsistent associations with responses to more straightforward questions.

As we expected, the percentage wage which would be foregone to remove asbestos danger is directly correlated with the ranking of health and safety as a bargaining issue and inversely correlated with wages as a bargaining issue, although the correlations are not statistically significant.[7]

Overall, these results stand in direct contrast to the intercorrelations of attitudes about the parties to the joint responsibility system. Those attitudes were highly consistent, whereas the tradeoff responses are often inconsistent. It appears that a union would have great difficulty finding a concensus among the rank and file about even the possibility of tradeoffs to improve health and safety. A union would have much less difficulty in finding a consensus on the efficacy of the current joint responsibility system.

This concludes our general presentation of the questionnaire responses. In the next chapter relationships between selected variables are investigated using correlation and regression analyses.

FOOTNOTES TO CHAPTER 4

1. We did not make any such comparisons with Certified due to the sampling problem at that plant.

2. This difference disappeared as a result of the October 1981 collective agreement at Abex.

3. Readers may also wish to consult Tables 3.1-3.4 for the full wording of the questionnaire items discussed here.

4. The overwhelming majority of these employees either worked in "dirty" areas of the plant: weighing and mixing, press, drilling and cutting operations, or they worked in "clean" areas but had over ten years service. This latter group probably had worked in dirty areas previously.

5. A significantly higher proportion of Abex workers said they had been ill because of dust while a higher proportion of Raybestos workers said they might have been so ill. If the "Yes" and "Maybe" responses are combined, there was no difference between the two plants.

6. Some dust tests on individual employees are done on behalf of the Ministry, and some are done privately for the companies.

7. The correlations between the percent wage foregone and other variables may not reach statistical significance because of the smaller sample sizes (about 40 cases instead of 80).

CHAPTER 5

EMPIRICAL RESULTS - RELATIONSHIPS AMONG VARIABLES

The second half of the empirical results concerns the interrelationships among various sets of variables. In our survey, two distinct kinds of information have been collected. First, there are demographic and other characteristics of individual respondents representing exogenous information; and second, there are attitudinal and behavioural variables which constitute endogenous information. The distinction between exogenous and endogenous variables has to do with causal relationships. An exogenous variable may influence endogenous behaviour, but cannot in turn be affected by that behaviour. For example, age, an exogenous variable, may affect one's attitude toward management's role in the health and safety process which is an endogenous variable, but clearly one's attitude cannot affect age. The cause-effect relationship, if indeed any relationship exists, can only be drawn in one direction, that is, from an exogenous to an endogenous variable.

Nineteen exogenous variables have been identified[1] from the questionnaire which will subsequently be examined for their relation to the four subsets of endogenous attitudes and/or behaviours: attitudes about the parties; perceived risk of asbestos; knowledge of rights and protections; and tradeoffs between risk and income. The hypotheses outlined in Chapter 3 pertain mainly to the effects of other variables on the latter category: tradeoffs. However, the other relations among variables are examined here as part of the exploration of the bases for workers' attitudes and knowledge in other related areas. For each of the

four endogenous categories, approximately six representative or composite variables have been correlated with the exogenous characteristics, using data drawn from the Raybestos and Abex samples. Certified data cannot be examined further because of sampling problems described in earlier chapters.

Because the exogenous variables are correlated with each other (e.g., women are found only in Raybestos), we hoped to measure separate effects of demographic characteristics upon endogenous variables, by estimating multiple regressions. Because of high correlations among some independent variables and sample sizes of only 70-80, it was not possible to include all nineteen demographic variables in the regressions. Instead, we used an ad hoc rule of including all exogenous variables in a given regression equation which were significantly correlated (at the .10 level or better) with a specific behaviour or attitude variable. These selected exogenous variables are also referred to as independent variables in the multiple regressions for a given endogenous or dependent variable. This method is arbitrary, and hence the regression results reported in this chapter must be considered at best exploratory. In addition to these relationships among variables, we also examined the correlations between the two dozen endogenous variables (about six from each of the four subsets). These relationships, if significant, do not necessarily imply causal links. For instance, if a perception of asbestos risk and an attitude toward management are correlated, it may be that one's perception caused the attitude; that one's attitude caused the perception; the attitude and perception caused each other in part; or finally, that some third phenomenon caused both the attitude and the perception. Unlike the previously described analyses, there are no logical lines of causality here; therefore, we did not attempt multiple regression analyses among the behavioural and attitudinal variables.

Exogenous Variables and Attitudes Toward the Parties

There were no directional hypotheses stated in Chapter 3 regarding relations of the exogenous variables with the attitudes toward the parties in general and in their roles involving the regulation of dust levels. Nevertheless, it is important to understand whether aspects of one's life or previous experience (e.g., the exogenous variables such as age, sex, household size, or having a dust-related illness) are associated with these attitudes. In this section, these associations are examined in order to understand better the bases of these attitudes.

Table 5.1 contains the simple correlation coefficients of each of the nineteen exogenous characteristics paired with each of six variables representing attitudes about the parties to the joint responsibility system. The demographic variables were defined as follows:

Plant: 1 = Raybestos; 0 = Abex

Sex: 1 = male; 0 = female

Age: In years

Compounding Location: 1 = Works in either mixing or pre-forming areas; 0 = otherwise

Nightshift: 1 = Works nightshift; 0 = otherwise

Size of Household

Number of Other Incomes Per Household: Ordinal variable which ranges from 0 for no other incomes to 3 for full-time working spouse plus 1 or more other part-time or full-time incomes

Health Rating: Self-rated health from 1 (very good) to 5 (poor)

Treated by Doctor: 1 = Treated by a doctor for illness or injury during last 12 months; 0 = otherwise

TABLE 5.1

Correlations Among Exogenous Variables and
Composite Attitude Variables Concerning Parties
Abex and Raybestos Combined

Exogenous Variables	Aggregate Attitude Variables Concerning Parties					
	Union-General	Union-Dust	Management-General	Management-Dust	Jt. H & S Committee	Inspectors
Plant	-.055	-.328***	-.068	-.169*	-.131	-.052
	(70)	(83)	(85)	(89)	(70)	(75)
Sex	-.038	.186**	.256***	.265***	.263**	.212**
	(70)	(83)	(85)	(89)	(70)	(75)
Age	-.150	-.227**	-.189**	-.152*	-.217**	-.157*
	(69)	(82)	(84)	(88)	(70)	(75)
Compounding Location	.073	.191**	.254***	.097	.103	.001
	(68)	(81)	(83)	(87)	(68)	(73)
Nightshift	.190*	.113	.020	-.039	-.012	-.046
	(70)	(83)	(85)	(89)	(70)	(75)
Size of Household	-.005	.068	-.028	.087	.048	-.026
	(70)	(83)	(85)	(89)	(70)	(75)
Number of Incomes per Household	-.082	.003	-.111	-.035	-.002	-.015
	(68)	(81)	(82)	(86)	(68)	(73)
Health Rating	-.021	.057	.048	.200**	.070	.045
	(68)	(82)	(83)	(87)	(68)	(73)
Treated by Doctor	.013	.163*	.159*	.205**	.122	-.019
	(70)	(83)	(85)	(89)	(70)	(75)
Number of Illnesses	.072	.138	.197**	.167*	.040	-.132
	(70)	(83)	(85)	(89)	(70)	(75)
Number of Cigarettes	-.151	-.145*	-.036	-.195**	-.215**	-.129
	(70)	(83)	(85)	(89)	(70)	(75)
Never Learned About Asbestos	.065	.084	.044	.185**	.330***	.122
	(70)	(83)	(85)	(89)	(70)	(75)
Sick because of Dust	.273**	.364***	.183**	.355***	.282***	.115
	(69)	(81)	(83)	(87)	(68)	(73)
# of Others Known Sick Because of Dust	-.166*	.043	.148*	.245**	.189*	.190**
	(68)	(80)	(82)	(86)	(67)	(72)
Relative Wage	.085	.180*	.001	-.082	.103	-.062
	(64)	(77)	(79)	(83)	(64)	(69)
Faced Danger at Work	.231**	.255***	.244**	.230**	.250**	.044
	(70)	(83)	(85)	(89)	(70)	(75)
Union Officer	-.208**	-.090	-.043	.109	.185*	.176*
	(70)	(83)	(85)	(89)	(70)	(75)
Number of Inspector Visits	-.093	.025	-.134	.110	.213*	.315***
	(68)	(79)	(80)	(85)	(66)	(71)
Overtime in June	-.136	.145*	-.011	.104	.215**	.038
	(66)	(80)	(81)	(85)	(67)	(72)

* Significantly different from zero for a two-tailed test at the .10 level.
** Significant at the .05 level.
*** Significant at the .01 level.

Number of Illness: Total of separate types of illnesses reported by category (ILL1 to ILL9); Range: 0-9

Number of Cigarettes: Number smoked yesterday

Never Learned about Asbestos: 1 = Respondent never learned about asbestos dangers; 0 = otherwise

Sick Because of Dust: 1 = Respondent has been sick because of dust; 0.5 = not sure; 0 = otherwise

Others Sick Because of Dust: Count of number of other workers known to be sick because of dust; range 0 to 3; 3 = 3 or more

Relative Wage: (Respondent wage/average wage in plant)

Faced Danger at Work: 1 = Respondent has faced a dangerous situation at work in the last year; 0 = otherwise

Union Officer: 1 = Held union office during last three years; 0 = otherwise

Number of Inspector Visits: Number of visits respondent believed to have occurred since January 1, 1981

Overtime in June: Hours of overtime worked in June, 1981

From the list above, it can be seen that there is a fine line between exogenous and endogenous variables. Some of these variables, unlike age or sex, do not contain purely objective information and could be affected by attitudes. Self-reported health, knowledge of people sick because of dust, and assessment of a danger fall into this category. Nonetheless, we feel that these responses are mainly generated by situations, perceptions,and events which occurred prior to the interview.[2]

With one exception, the attitude variables in the subset reported in Table 5.1 are composites of two attitudinal questions which were answered

on a 1 to 5 scale, with lower scores representing more favourable responses. We have developed general and dust-related composite attitudes for both the union and management, and a single composite variable for the joint health and safety committee. Because responses to the statement about the legal environment (25e) were considered unreliable, the government/public policy attitude is based solely on the attitude item concerning government inspectors. The variables are defined as follows:

Union-General = (24a + 24c)/2

Union-Dust = (25c + 25h)/2

Management-General = (24b + 24d)/2

Management-Dust = (25a + 25g)/2

Joint H & S Committee = (25d + 25j)/2

Inspectors = 25f[3]

The purely demographic variables that are the most often highly correlated with attitudes are age and sex. Women and older workers have significantly more favourable attitudes about all the parties to the responsibility system (the only exception is the union-general attitude). These results are not surprising because the women at Raybestos worked in cleaner and less physically taxing jobs while older workers have, no doubt, seen tremendous improvements in working conditions during the last two decades.

Raybestos workers generally exhibited more positive attitudes about the parties than Abex employees, but they were only significantly more favourable to union and management in their dust-related roles.

As expected, the degree of asbestos exposure was associated with more negative attitudes. Respondents who worked in compounding, the area with the greatest concentration of airborne asbestos, expressed significantly

less favourable attitudes for "union-dust" and "management-general" categories than respondents who worked elsewhere. (Other attitudes were in the less favourable direction but insignificant.) In addition, as the amount of overtime worked (and therefore exposure) by respondents increased, their attitudes to the union and the joint committee vis à vis dust were increasingly unfavourable.

Some demographic variables which we expected to influence attitudes were largely independent. The size and number of earners in the household were both completely unrelated to attitudes about the parties. A respondent's relative wage in the plant and whether one worked the nightshift were also largely unassociated with attitudes.

A number of health variables were also related to attitudes. Respondents who felt that they have been sick because of dust gave all parties (except inspectors) significantly lower grades. The greater the number of others known to be ill from dust, the more negative were the attitudes toward management, toward the joint committee and government inspectors, but the more positive the attitude toward the union. Respondents who had been treated by a doctor for illness, who reported more kinds of illness, and/or who rated their own health poorly also tended to view management less favourably. The union in its dust regulation role was also viewed less favourably by workers who had been treated by a doctor. Many workers apparently associate their ill health at least partly with the workplace.

By contrast, as the number of cigarettes smoked increased among respondents,their attitudes toward the union, management, and the joint committee in their dust-related roles becomes more positive. We had raised this issue in Chapter 3 in the hypotheses section. We were not certain whether one's smoking habits would positively or negatively

affect attitudes toward the parties. This consistent pattern of correlation suggests that heavy smokers are apparently less concerned about substances entering their lungs, on and off the job, and are more likely to view the parties as doing a good job.

Not surprisingly, respondents who had held a union office or committee membership in the last three years held more positive attitudes to the union in general than non-office holders. Office holders were also negative toward the joint committee and government inspectors. It is interesting that there was no significant correlation between office holding and attitudes toward the union on dust regulation or attitudes toward management.

As one might expect, respondents who said they had faced a dangerous situation at work during the previous year expressed significantly less favourable attitudes about their union, management, and the joint committee.

Some exogenous variables were associated with attitudes in unexpected ways, however. One would expect that workers who had never learned about asbestos dangers would be less concerned about exposure and, like smokers, have relatively positive attitudes toward to the parties. In fact, such workers were more negative on all attitudes and significantly more so regarding "management-dust" and the joint committee.

The "never learned about asbestos dangers" variable was a category created from replies to the question asking respondents where and from whom they had learned about asbestos dangers. The pattern of correlation in this and subsequent sections suggests that respondents replying in this manner had never <u>formally</u> learned about asbestos dangers. They may have known in general that there were dangers, or they may have concluded as a consequence of our survey that there were dangers, but they could

not identify a particular party as having informed them of the dangers.

Another finding had to do with inspectors' visits. One would think that the more inspector visits respondents were aware of, the more positive they would be about the system. Surprisingly, however, the greater the numbers of visits reported, the less favourable were the attitudes to the joint committee and inspectors themselves. It may be that a larger number of visits were associated with dust problems which neither the joint committee nor the inspector effectively resolved. More visits may be seen as more evidence of unresolved health and safety problems.

Table 5.2 presents the standardized regression coefficient estimates for the six attitude equations. As mentioned earlier, only exogenous variables significantly correlated with attitude variables were included in the respective regressions. The results must therefore be viewed as exploratory in nature.

The major advantage of these regression analyses is that they provide an estimate of the impact of one exogenous or independent variable, holding constant all the other exogenous variables included in the equation. For example, in the "union-dust" regression, age was significantly associated with more favourable attitudes, even after controlling for many other variables such as the respondent having a dust-related illness or knowing other workers who have a dust-related illness. We might expect age to be associated with having dust-related illnesses or knowing others with such illnesses because older workers generally would have more exposure to asbestos, and would, by virtue of having been at the plant longer, know more people with dust-related illness. This regression tells us that age was still associated with the attitude in question even when the effects of known illnesses were

TABLE 5.2

Multiple Regression Estimates for the Composite Attitude Equations Abex and Raybestos Combined

	Standardized Regression Coefficients					
Independent Variables	Union-General 1	Union-Dust 1	Management-General 1	Management-Dust 1	Jt. H & S Committee 1	Inspector 1
Plant	--	-.329*** (2.62)(2)	--	-.226* (-1.95)	--	--
Sex	--	.093 (.80)	.286** (2.53)	.133 (1.23)	.192 (1.50)	.179 (1.47)
Age	--	-.338*** (-2.89)	-.271** (-2.16)	-.304** (-2.58)	-.282** (-2.19)	-.274** (-2.15)
Compounding Location	--	.204* (1.77)	.173 (1.49)	--	--	--
Nightshift	-.004 (-.03)	--	--	--	--	--
Health Rating	--	--	--	.123 (1.10)	--	--
Treated by Doctor	--	-.036 (-.34)	-.189 (-1.17)	.149 (1.10)	-- --	--
Number of Illnesses	--	--	.224 (1.36)	-.118 (-.84)	--	--
Number of Cigarettes	--	.061 (.58)	--	-.074 (-.73)	-.036 (-.27)	--
Never Learned About Asbestos	--	--	--	.175* (1.76)	.283** (2.27)	--
Sick Because of Dust	.273** (2.43)	.307*** (2.83)	.061 (.53)	.254** (2.40)	.215* (1.87)	--
# of Others Known Sick Because of Dust	-.181 (-1.51)	--	.076 (.63)	.288** (2.28)	.133 (.93)	.197 (1.46)
Relative Wage	--	.181* (1.69)	--	--	--	--
Faced Danger at Work	.247** (2.20)	.030 (.26)	.070 (.58)	.084 (.77)	.108 (.86)	--
Union Officer	-.337*** (2.94)	--	--	--	.075 (.62)	.087 (.71)
Number of Inspector Visits	--	--	--	--	.123 (1.05)	.239** (2.03)
Overtime in June	--	.091 (.80)	--	--	.169 (1.36)	--
Adj. R^2	.235	.299	.141	.286	.274	.119
F	5.05	4.04	2.57	3.99	3.19	2.81
df	5,61	10,61	8,69	11,71	10,48	5,62

* Coefficient significantly different from zero for a two-tailed t-test at the .10 level.
** Significant at the .05 level.
*** Significant at the .01 level.
1. Dependent variable of regression equation.
2. t-value in parentheses.

controlled.[4] Also, as a contrasting example, the number of cigarettes smoked was not significantly related to the "union-dust" attitude after other variables had been controlled (even though the simple correlation was significant). Overall, the regression equations have the greatest power for predicting respondents' attitudes toward union, management, and the joint committee in their dust-related roles; in these cases, the independent or exogenous variables "explain" almost 30% of the variance in the dependent or endogenous variables.[5] This compares to 24%, 14%, 12% for the "union-general," "management-general," and"inspector" equations, respectively.

Turning our attention to the specific equations, we find that workers who had faced dangerous work situations and/or illness due to dust exhibited significantly less favourable general attitudes toward their union with all other variables controlled, but union officers (current or past) had significantly more positive attitudes toward the union in general. General management attitudes were only related to sex and age. Older and women workers were significantly more positive about management, holding other variables constant.

Many of the same exogenous variables were important in explaining union and management dust-related attitudes. Other things equal, older and Raybestos (as opposed to Abex) respondents held significantly more favourable attitudes toward both parties; whereas workers who said they were sick because of the dust held significantly less favourable attitudes. Respondents who worked in compounding areas and who had higher relative wages also gave their union significantly lower marks; whereas respondents who knew of others sick because of dust or who had never learned about asbestos dangers gave management significantly lower grades.

Older workers also displayed more positive attitudes about the joint committee and inspectors, but workers who did not know of asbestos dangers or who had been sick because of dust were negative about the joint committee when every other variable in the equation was controlled. Finally, knowing of more inspectors' visits remained significantly associated with negative attitudes toward inspectors when other variables were held constant.

In total, the correlation and regression results call attention to two points. First, there is the ameliorating factor of age on attitudes toward the parties. To the extent that older workers are over-represented in union political hierarchy, their more favourable opinions about the current responsibility system will have important consequences for union policy and priorities at the bargaining table. Second, the most important determinant of negative attitudes to all parties is personal awareness of illness. Being ill because of dust obviously brings home the inadequacies of the various parties in dealing with dust levels in the plant. For such workers, any recent improvements or anticipated improvements in the system may be viewed as 'too little, too late.'

Exogenous Variables and Perceptions of Risk

Correlations between the exogenous variables and five variables measuring perception of risk are shown in Table 5.3. Three exogenous variables measure perception of risk: having faced extra danger at work, knowledge of one's own dust-related illness, and knowledge of others' dust-relate illnesses. They have been included in the exogenous set because they represent p

TABLE 5.3

Correlations Among Exogenous Variables and Perceptions of Asbestos Risk
Abex and Raybestos Combined

	Perceptions of Risk				
Exogenous Variables	Safe Dust Level Can be Set	Equipment Makes Dust Levels Safe	Can Tell Dust Levels	Would Want Family to Work at Plant	Health & Safety Conditions at Plant (improved-worsened)
Plant	.050	.195**	.012	.044	.090
	(78)	(76)	(67)	(86)	(83)
Sex	-.065	.282***	.220**	-.191**	-.055
	(78)	(76)	(67)	(86)	(83)
Age	.036	-.131	.093	-.198**	-.154*
	(77)	(75)	(67)	(85)	(82)
Compounding	-.098	.096	.094	.119	.196**
Location	(77)	(74)	(65)	(84)	(81)
Nightshift	-.149*	.038	-.019	.074	-.100
	(78)	(76)	(67)	(86)	(83)
Size of	.061	.176*	.081	-.090	.044
Household	(78)	(76)	(67)	(86)	(83)
Number of Incomes	.158*	.241**	.014	-.007	.076
per Household	(75)	(73)	(64)	(83)	(80)
Health Rating	.007	.075	-.109	-.133	.222**
	(76)	(74)	(65)	(84)	(81)
Treated by	-.141	-.055	-.005	-.070	-.060
Doctor	(78)	(76)	(67)	(86)	(83)
Number of	-.169*	.111	-.094	-.090	-.146*
Illnesses	(78)	(76)	(67)	(86)	(83)
Number of	.079	.089	.197*	.163*	-.090
Cigarettes	(78)	(76)	(67)	(86)	(83)
Never Learned	.287***	-.026	.206**	-.164*	-.101
About Asbestos	(78)	(76)	(67)	(86)	(83)
Sick Because of	-.074	.118	-.074	-.109	.164*
Dust	(76)	(74)	(66)	(84)	(81)
# of Others Known Sick	.170*	.160*	.159	-.420***	.131
Because of Dust	(75)	(73)	(66)	(83)	(80)
Relative Wage	-.045	-.166*	.151	.154*	-.101
	(74)	(70)	(62)	(80)	(77)
Faced Danger	.014	.186*	.099	.008	.137
at Work	(78)	(76)	(67)	(86)	(83)
Union Officer	.024	.037	-.072	-.262***	-.162*
	(78)	(76)	(67)	(86)	(83)
Number of Inspector	.008	.103	.097	-.280***	.007
Visits	(74)	(72)	(64)	(81)	(79)
Overtime in June	-.119	.057	.008	-.003	-.161*
	(74)	(73)	(65)	(82)	(79)

* Significantly different from zero for a two-tailed t-test at .10 level.
** Significant at the .05 level.
*** Significant at the .01 level.

experiences which may affect attitudes, but they are unlikely to be affected by attitudes. Two endogenous variables in this subset are individual attitude scores based on the 1 to 5 scale representing respectively strongly agree to strongly disagree. These two variables represent attitude statements that a "safe level can be set" (29a) and that respondents "can tell unsafe dust levels" (29f). The "equipment makes dust levels safe" variable is the average of two attitude variables [(29d + 29e)/2] which refer to the protective capacity of equipment. The exceptions to this are the "tell family member to work at plant" variable which was coded 0 for no, 0.5 for maybe, and 1 for yes; and the "health and safety conditions" variable which was coded on a scale ranging from 1 for greatly improved to 5 for greatly worsened.

As in the previous section, there are no hypotheses being tested here. We are similarly presenting these analyses as part of the exploratory aspects of this study.

Among the endogenous variables pertaining to perceived risk, the "safe dust level can be set" statement was more strongly agreed with by respondents working the nightshift, those with fewer household incomes, and those with a greater variety of illnesses during the last year. Respondents who said they never learned about asbestos dangers, and/or who knew more people who were sick because of asbestos dust disagreed with the statement more strongly. Respondents who more strongly disagreed with the "equipment makes dust levels safe" composite variable, were Raybestos employees, men, respondents with larger households, respondents with more income earners in their households, those with lower relative wages, those who knew others sick because of dust, and those who had faced danger since January 1981. Workers who agreed that they could tell when dust levels were unsafe were more likely to be women and

non-smokers or lighter smokers, but workers who said they had never learned about asbestos dangers were less likely to agree.

One of the variables which was a very good indicator of perceived risks in the work environment was whether or not respondents would recommend that a family member work at the plant. This was correlated with a number of exogenous variables. Those less likely to recommend working in the plant to a family member were men, older workers, lighter smokers, those who had "never learned about asbestos," those who knew more workers with dust-related illness, those with relatively lower wages, those who had held a union office,and those who were aware of more inspector visits.

Respondents noting improved health and safety conditions in the plant over the last year were more likely to be older workers, those who worked in areas other than compounding, those who rated their overall health as better, those with a greater variety of illnesses during the last year, those who were not themselves sick because of the dust, those who had held union office, and those who had worked more overtime in June.

No overall patterns of correlation here are as clearly defined as in the previous section. Only three exogenous variables were associated with at least three of the endogenous perceived risk variables. As in the previous subset, women held more positive attitudes. They more strongly agreed that safety equipment provided adequate protection from dust hazards and were more likely to recommend that a family member work at the plant. Also, women were more likely to agree that they could discern higher than normal dust levels. Also like the previous subset, those who had "never learned about asbestos" were more negative. They more strongly disagreed with the idea that a safe dust level could be set, were less willing to recommend that a family member take a job at

the plant, and were less likely to agree that they could tell above normal dust levels. Finally, the exogenous perceived risk variable, the number of others known to have dust-related illness, was associated in the expected directions with three of the five endogenous perceived risk variables. The more people whom the respondents knew to be ill because of dust, the more negative the respondents were about the efficacy of equipment, and the ability to set a safe dust level. Further, there was a very strong correlation showing that respondents knowing more people with dust-related illnesses were much less likely to recommend that a family member work at the plant.

The contributions of the exogenous variables in predicting perceptions of risk were further examined in multiple regressions summarized in Table 5.4. These regression equations "explained" between 7% and 18% of the variance in the attitude scores, and as such did not account for as much variance as did the equations in the previous section.

The regression on the "safe level can be set" statement explained 11% of its variance. Only "never learned about asbestos" was significantly related to this statement when the other variables were held constant. As we have already noted, the respondents who said they never learned about asbestos dangers held very negative attitudes regarding the various parties. These attitudes are further reflected in a greater disagreement with the notion that a safe dust level can be set.

The regression on the composite equipment safety variable explained 18% of its variance with sex, number of household incomes, relative wage, and "faced danger," making significant contributions when all other variables were held constant. Women were more positive toward the adequacy of safety equipment, perhaps because they did not usually work in areas where they used machinery extensively. Also, those with more

TABLE 5.4

Multiple Regression Estimates for the
Perception of Risk Equations
Abex and Raybestos Combined

Independent Variables	Standardized Regression Coefficients				
	Safe Level Can be Set 1	Equipment Makes Dust Levels Safe 1	Can Tell Dust Levels 1	Would Want Family to Work at Plant 1	Health Conditions at Plant 1
Plant	--	-.093 (-.72)2	--	--	--
Sex	--	.292** (2.13)	.207* (1.74)	-.046 (-.39)	--
Age	--	--	--	-.130 (-.98)	-.157 (-1.26)
Compounding Location	--	--	--	--	.163 (1.43)
Nightshift	-.106 (-.88)	--	--	--	--
Size of Household	--	.058 (.47)	--	--	--
Number of Incomes in Household	.167 (1.44)	.277** (2.20)	--	--	--
Health Rating	--	--	--	--	.301** (2.30)
Number of Illnesses	-.178 (-1.50)	--	--	--	-.256** (-2.04)
Number of Cigarettes	--	--	.167 (1.39)	.055 (.47)	--
Never Learned About Asbestos	.268** (2.27)	--	.169 (1.41)	.049 (.42)	--
Sick Because of Dust	--	--	--	--	.134 (1.11)
# Others Known Sick Because of Dust	.124 (.95)	.063 (.49)	--	-.309** (-2.32)	--
Relative Wage	--	-.287** (-2.40)	--	.246** (2.04)	--
Faced Danger	--	.260** (2.12)	--	--	--
Union Officer	--	--	--	-.052 (-.42)	-.092 (-.75)
Number of Inspector Visits	--	--	--	-.111 (-.94)	--
Overtime in June	--	--	--	--	-.061 (-.53)
Adj. R^2	.109	.182	.071	.169	.110
F	2.73	3.00	2.68	2.78	2.29
df	5,66	7,56	3,63	8,62	7,66

* Significantly different from zero for a two-tailed t-test at the .10 level.
** Significant at the .05 level.
*** Significant at the .01 level.
1. Dependent variable of regression equation.
2. values in parentheses.

household incomes tended to view safety equipment as less adequate. We offer no tentative explanation for this finding. The higher one's relative wage, the more likely one is to agree that equipment adequately protects one's safety. There is, likewise, no obvious explanation for this association although we can speculate that better paid workers either may be more defensive about the safety of the work environment, or they may work in areas where equipment provides better protection. Those who faced danger were less likely to say that equipment protected their safety. This is logical because many work-related dangers are very likely related to equipment failure.

An insignificant amount of variance (7%) was explained in the regression on the "can tell unsafe dust levels" variable; thus the exogenous variables did not account for much of the respondents' ratings of this item.

In contrast, 17% of the variance in recommending a job at the plant to family members was explained by the regression. The number of people known to be sick because of dust and the relative wage contributed significantly to the equation with all other variables held constant. As one might expect, those knowing more sick people were less willing to recommend that a family member work at the plant, but those with higher relative wages were more likely to make the recommendation. This latter finding is consistent with the earlier finding that higher paid workers are more likely to believe that the equipment makes the work environment safe. Presumably if the environment is perceived safe, and if one's wages are relatively high, it is reasonable to recommend a job in the plant to a family member.

The exogenous variables accounted for only 11% of the variance in the perceived change in health and safety conditions in the plant. The

respondents' health rating and the variety of illnesses reported were significantly related to perceived changes in the plant when controlling for all other variables. A poorer health rating was associated with a perceived worsening of health and safety conditions at the plant. This seems to be a logical association, but, inexplicably, greater perceived improvements in health and safety were associated with the greater variety of illnesses which respondents reported themselves as having suffered during the year.

Exogenous Variables and Knowledge of Rights and Protections

Correlations between exogenous variables and knowledge of rights and protections are shown in Table 5.5. This is another set of exploratory analyses which indirectly relate to the specific directional hypotheses. The four selected knowledge variables are all responses to individual questionnaire items: naming the health and safety representative (0 for incorrect or no name given; 1 for correct name); "can refuse dangerous work" (1 for strongly agree to 5 for strongly disagree); "tried to get test results" (0 for never tried to get dust test results, 1 for knew tests were available or tried even if unsuccessful); "would refuse work in future danger" (0 for not mentioned as a response to future danger, 1 for mentioned).

None of these knowledge variables was correlated with age, number of incomes in the household, or number of cigarettes smoked the day before the interview. Correctly naming a health and safety representative was more likely for men, for workers at Abex, for workers in compounding areas, for nightshift workers, for workers with larger households, for

TABLE 5.5

Correlations Among Exogenous Variables
and Knowledge of Rights and Protections

Exogenous Variables	Knowledge Variables: Knows a H&S Rep.	Can Refuse Dangerous Work	Tried to Get Tests	Would Refuse Work in Future Danger
Plant	-.231**	.163*	.384***	.057
	(91)	(82)	(90)	(87)
Sex	.165*	.150*	.074	.273***
	(91)	(82)	(90)	(87)
Age	.001	.032	-.015	-.037
	(90)	(82)	(89)	(86)
Compounding Location	.161*	.136	.077	.183**
	(89)	(81)	(88)	(85)
Nightshift	.204**	-.086	-.128	.131
	(91)	(82)	(90)	(87)
Size of Household	.144*	.027	.118	.213**
	(91)	(82)	(90)	(87)
Number of Incomes per Household	-.051	-.047	-.060	-.003
	(88)	(80)	(87)	(84)
Health Rating	-.160*	.255**	-.001	.056
	(89)	(80)	(88)	(85)
Treated by Doctor	-.023	-.116	.232**	.082
	(91)	(82)	(90)	(87)
Number of Illnesses	-.026	-.075	.168*	.024
	(91)	(82)	(90)	(87)
Number of Cigarettes	.081	-.005	-.089	-.088
	(91)	(82)	(90)	(87)
Never Learned About Asbestos	-.076	-.091	.010	.169*
	(91)	(82)	(90)	(87)
Sick Because of Dust	.064	.228**	.016	-.033
	(89)	(80)	(88)	(85)
# of Others Known Sick Because of Dust	.081	-.033	.318***	.240**
	(88)	(80)	(87)	(84)
Relative Wage	.172*	-.085	-.022	.137
	(85)	(77)	(84)	(81)
Faced Danger at Work	.197**	-.030	.160*	.205**
	(91)	(82)	(90)	(87)
Union Officer	.120	-.169*	.320***	.217**
	(91)	(82)	(90)	(87)
Number of Inspector Visits	.223**	.046	.007	.199**
	(82)	(86)	(85)	(83)
Overtime in June	.083	.155*	-.087	-.160*
	(87)	(80)	(86)	(83)

* Significantly different from zero for a two-tailed t-test at the .10 level.
** Significant at the .05 level.
*** Significant at the .01 level.

workers who rated their health as better, who had higher relative wages; who had faced danger at work, and who knew of more visits by inspectors.

Workers who agreed that they could refuse unsafe work were more likely to be from Abex, to be women, to rate their health as better, not to be sick because of dust, to have held union office, and to have worked less overtime in June.

The respondents who tried to get results were more likely to be from Raybestos, to have seen a doctor in the last year, to have reported a greater number of different illnesses, to know a greater number of people sick from dust, to have faced danger at work, and to have held union office.

The fourth and last knowledge variable, "would refuse work in future danger," was cited as a possible action more often by men, workers in compounding areas, workers with larger households, workers who had "never learned about asbestos," who knew more people with dust related-illness, who had previously faced danger at work, who had held a union office, who knew of more inspectors' visits, and who had worked less overtime in June.

The exogenous variables, plant, sex, and "union office held," were each correlated with three of the four knowledge variables. The pattern for plants was interesting. More Abex workers knew a health and safety committee representative, yet they were less likely to agree that they could refuse dangerous work and less likely to have tried to obtain dust test results. This suggests that knowing one's representative is no guarantee that one will know or exercise one's rights.

Women were less likely to agree that one could refuse dangerous work; to say they would refuse dangerous work in the future; and, as well, they were less likely to know a health and safety committee representative. Women respondents, therefore, appeared to be generally uninformed

regarding their rights and protections.

Not surprisingly, having held a union office was associated with agreeing that one could refuse dangerous work and citing refusal as a possible future action. As well, those who held office were more likely to have tried to get dust test results. While the correlation was in the expected direction, holding union office was not significantly associated with knowing the health and safety representative. This may be because of the relatively high proportion of workers at both plants who knew their representatives.

The multiple regressions for the knowledge variables are in Table 5.6. The regression equation "explained" only 7% of the variance in the naming of the health and safety representative. No single exogenous variable was significant when controlling for all other exogenous variables. (As in the other regressions, only those exogenous variables correlated with the criterion variable at the .10 level of significance were included in the regression equations.)

For the attitude statement, "may refuse to do dangerous work," 12% of the variance was explained by the regression equation. The respondents' health rating, being ill because of dust, and "union office held" were each significant when all the other variables were held constant. The poorer the respondents' health rating, the less agreement there was that one can refuse dangerous work without penalty. Similarly, reporting oneself ill from dust was associated with less agreement. We cannot find an obvious reason for this association. However, one who held a union office would be more likely to know the law and, therefore, to agree more strongly that one can refuse dangerous work.

The regression for refusal as a future response to danger yielded a different pattern of results. The same proportion of variance was

TABLE 5.6

Multiple Regression Estimates for Knowledge of Rights and Protections Equations Abex and Raybestos Combined

Independent Variables	Standardized Regression Coefficients			
	Knows a H&S Rep. 1	Can Refuse Dangerous Work 1	Tried to Get Tests 1	Would Refuse Work in Future Danger 1
Plant	-.179	.014	.303***	--
	(-1.44)	(.10)	(3.06)	
Sex	.128	.109	--	.180
	(1.03)	(.93)		(1.48)
Compounding Location	.096	--	--	.136
	(.74)			(1.11)
Nightshift	.100	--	--	--
	(.83)			
Size of Household	-.051	--	--	.097
	(-.44)			(.82)
Treated by Doctor	--	--	.261*	--
			(1.97)	
Health Rating	-.129	.233**	--	--
	(-1.11)	(2.04)		
Number of Illnesses	--	--	-.188	--
			(1.36)	
Never Learned About Asbestos	--	--	--	.133
				(1.14)
Sick Because of Dust	--	.212*	--	--
		(1.85)		
# Others Known Sick From Dust	--	--	.173	.031
			(1.64)	(.22)
Relative Wage	.098	--	--	--
	(.87)			
Faced Danger at Work	.143	--	.096	.103
	(1.11)		(1.01)	(.87)
Union Officer	--	-.252**	.246**	.164
		(-2.24)	(2.37)	(1.34)
Number of Inspector Visits	.173	--	--	.123
	(1.44)			(1.04)
Overtime in June	--	.175	--	-.186
		(1.50)		(-1.61)
Adj. R^2	.074	.116	.248	.118
F	1.68	2.66	5.72	2.09
df	9,68	6,70	6,80	9,64

* Significantly different from zero for a two-tailed test at the .10 level.
** Significant at the .05 level.
*** Significant at the .01 level.
1. Dependent variable of regression equation.
2. t-value in parentheses.

explained (12%), but no exogenous variable was a significant predictor when controlling for all other variables in the regression.

The variance in "tried to get test results" was somewhat better explained by the regression equation with 25% of the variance accounted for. Having held a union office, having been treated by a doctor, and working at Raybestos (i.e., the plant variable) were each significantly associated with the test variable when controlling for all others. As noted in an earlier section, some Raybestos union officials said they encouraged their union members to try to obtain test results. This would also account for union office holders being more likely to obtain test results. We can also surmise that having been treated by a a doctor reflects greater concern (or need to be concerned) with one's health which, in turn, would be consistent with seeking test results.

This concludes the presentation of the relations between exogenous variables and the first three subsets of endogenous variables. Because of the exploratory nature of these analyses, the following caution is offered before proceeding to the examination of hypotheses regarding tradeoffs.

The correlation and regression analyses of the exogenous variables with various variables measuring attitudes toward the parties, perceived risk in the workplace, and knowledge of rights and protections show how many factors can affect employees' attitudes. It should be noted, though, that in all the analyses presented thus far, less than half of the variance in each of the variables was "explained," and in a few cases less than 10% was "explained," by the exogenous variables. As previously indicated, we cannot assume causal relations in the correlations reported. Having held a union office, for instance, seems to "cause"

greater knowledge and perception of risk. One's exposure to extra information while holding union office could readily affect one's knowledge and perceptions. On the other hand, the decision to run for office or to serve on a union committee may be caused by one's greater knowledge or one's perceptions of greater risk. It is quite likely that such causal relations may go in one direction for some employees, but in the opposite direction for others. If we had a larger sample we could, no doubt, tease out more subtle relations between variables, but our purpose here is to summarize attitudes and other responses rather than to develop more effective predictive models.

Exogenous Variables and Tradeoffs

Table 5.7 displays the correlation coefficients between the exogenous and the six tradeoff variables. The six selected tradeoff variables are "ban asbestos" (coded 1 if respondents said yes, that a law banning asbestos was a good idea; 0 if they said no); "desired overtime" (the number of hours of overtime per month which respondents would like to work); "health and safety bargaining rank" (the ranking of health and safety as a bargaining issue from 5 for the most important to 0 for not mentioned); "tougher health and safety regulations mean job loss" and "I would trade wages to remove danger" (both coded from 1 for strongly agree to 5 for strongly disagree); and finally "% wage I would give up" (actual percent of wages respondents said they would give up after answering the previous statement). Because many of the tradeoff variables have unique forms of coding we cannot assume a direction of attitude from the sign of the correlation coefficient; consistent reluctance to give up income (and

TABLE 5.7

Correlations Among Exogenous Variables and Tradeoff Variables
Abex and Raybestos Combined

Exogenous Variables	Tradeoff Variables					
	Ban Asbestos?	Desired Overtime	Health & Safety Bargaining Rank	Tougher H&S Regs. Mean Job Loss	I Would Trade Wages to Remove Danger	% Wage I Would Give Up
Plant	-.064	.109	-.137	-.075	-.161*	.229*
	(80)	(84)	(89)	(76)	(76)	(44)
Sex	-.142	-.241**	-.002	-.132	.155*	.046
	(80)	(84)	(89)	(76)	(76)	(44)
Age	-.162*	-.228**	-.057	-.108	.165*	-.008
	(80)	(83)	(88)	(75)	(76)	(44)
Compounding Location	.155*	.046	.000	-.093	-.038	.114
	(78)	(82)	(87)	(74)	(74)	(42)
Nightshift	.025	.176*	.106	-.027	-.173*	.093
	(80)	(84)	(89)	(76)	(76)	(44)
Size of Household	-.139	.167*	-.067	.196**	.029	.090
	(80)	(84)	(89)	(76)	(76)	(44)
Number of Incomes per Household	-.167*	.005	-.114	.259**	.137	-.142
	(77)	(82)	(86)	(74)	(73)	(44)
Health Rating	.080	-.245**	.103	-.079	.019	.028
	(78)	(82)	(87)	(75)	(75)	(44)
Treated by Doctor	-.020	.054	.006	-.028	-.156*	.060
	(80)	(84)	(89)	(76)	(76)	(44)
Number of Illnesses	-.100	-.101	.006	.047	-.024	.145
	(80)	(84)	(89)	(76)	(76)	(44)
Number of Cigarettes	-.344***	.104	-.110	-.214**	.285***	-.274**
	(80)	(84)	(89)	(76)	(76)	(44)
Never Learned About Asbestos	-.0506	-.244**	-.099	.031	-.060	.071
	(80)	(84)	(89)	(76)	(76)	(44)
Sick Because of Dust	.075	.011	.295***	-.088	-.404***	.357***
	(78)	(82)	(87)	(74)	(74)	(43)
# of Others Known Sick Because of Dust	-.006	-.279***	-.007	-.115	.099	.213*
	(77)	(81)	(86)	(74)	(74)	(43)
Relative Wage	-.093	.169*	.016	-.115	.016	.182
	(74)	(80)	(83)	(70)	(71)	(39)
Faced Danger at Work	.118	-.047	.309***	-.080	-.227**	.487***
	(80)	(84)	(89)	(76)	(76)	(44)
Union Officer	-.182*	-.060	-.007	.080	-.152*	.157
	(80)	(84)	(89)	(76)	(76)	(44)
Number of Inspector Visits	.277***	-.022	.056	.211**	-.090	.303**
	(77)	(79)	(85)	(73)	(73)	(43)
Overtime in June	.037	.187**	-.140*	.157*	.254**	-.100
	(78)	(82)	(85)	(73)	(74)	(44)

* Significantly different from zero for a two-tailed t-test at the .10 level .
** Significant at the .05 level.
*** Significant at the .01 level.

security) for reduced asbestos health risk would be expected to change signs across correlations. Such a variable would be inversely (negatively) related with "ban asbestos," "health and safety rank," "tougher regulations," and "% wage I would give up," and positively correlated with "desired overtime" and "I would trade wages."

In Chapter 3, we had hypothesized that several significant correlations would be found between exogenous variables and tradeoff variables. Wages were hypothesized to be positively associated with a willingness to trade wages for health because better paid workers could presumably better afford a tradeoff. However, higher relative wages were associated with a greater desire to work overtime. This was the only significant correlation for wages, and it was in a direction opposite to the prediction. We are not certain why this occurred, but it may relate to the fact that overtime is paid as a multiple of one's hourly wage. The substitution of safety for overtime is more costly in absolute terms for employees with higher hourly wages than employees with lower hourly wages.

Family size was predicted to be negatively associated with willingness to trade off wages because a larger family would presumably entail greater financial responsibilities. Larger families were significantly correlated with more desired overtime, thus confirming our predictions. Respondents with larger families also tended to disagree that job loss would be a consequence of tougher health and safety laws. Family size was not significantly associated with any other tradeoff variables.

We had also predicted that older workers would be less willing to make tradeoffs because many health improvements would be too late for many older employees with many years of asbestos dust exposure. Older

workers were significantly less likely to agree with banning asbestos or to agree to trade wages to remove danger, but they were significantly less willing to work overtime. The first two correlations are in the predicted direction, but the correlation with overtime was opposite to our prediction. Older people may not want to work overtime for other reasons such as lesser need for extra income or less desire to be fatigued by extra work.

We had also hypothesized that greater personal knowledge of, and/or experience with, risk and dust-related illnesses would be associated with greater willingness to trade wages for better health and safety. As predicted, respondents who believed they had a dust-related illness, knew others who were sick, or who had faced a dangerous situation at work were generally more willing to trade off income (security) for reduced asbestos health risks.

Knowing of more inspectors' visits was associated with agreement with a law banning asbestos, disagreement that tougher laws would create job loss, and a willingness to give up a larger percentage of one's wages to ensure a healthier work environment. We had not predicted these findings, but they fit with earlier suggestions that respondents may associate more inspectors' visits with greater risks in the workplace.

Another finding of interest was that those who had "never learned about asbestos dangers" were less willing to work overtime. This further supports our earlier suggestion that respondents who had "never learned" had not been formally told about asbestos dangers, but these workers were nonetheless well aware of the hazards.

A number of other exogenous variables were consistently associated with tradeoff variables. We were concerned about the effect of smoking habits on these variables, but we did not predict the direction of

the effect. We found that the more cigarettes respondents smoked, the less willing they were to sacrifice income for greater health protection. This effect was significant for four of six tradeoff variables. This is an important attitude, given that health risks of asbestos are many times greater for smokers than non-smokers.

Respondents who worked more overtime hours in June were generally more concerned about income than asbestos risk. Apparently, few workers are forced to work overtime.

Table 5.8 summarizes the six regressions estimated to "explain" the tradeoff variables. For two of the regressions, those predicting the rank of health and safety as a bargaining issue and the "tougher regulations" variable, the independent variables explained less than 13% of the variance. The other regressions were somewhat better, explaining between 21% to 42% of the variance in the four other tradeoff variables.

When controlling for other independent variables, heavy smokers were less likely to believe that banning asbestos was a good idea. Ironically, past or present union officials were significantly less enthusiastic about banning asbestos products although this was a recommendation to the Commission by the Ontario Federation of Labour. Respondents reporting fewer inspector visits were also less in agreement with such a ban. No additional variables were significantly related to "ban asbestos," once other influences were controlled.

Four exogenous variables -- sex, relative wage, "never learned about asbestos," and overtime in June -- were each associated with desired overtime when all other variables were controlled. Women, higher wage earners, and those who had worked more actual overtime in June all desired a greater amount of overtime, but those who had "never learned about asbestos dangers" desired less overtime. As noted in a previous

TABLE 5.8

Multiple Regression Estimates for
Tradeoff Equations
Abex and Raybestos Combined

Independent Variables	Standard Regression Coefficients					
	Ban Asbestos? 1	Desired Overtime 1	Health & Safety Bargaining Rank 1	Tougher H&S Regs. Mean Job Loss 1	I Would Trade Wages to Remove Danger 1	% Wage I Would Give Up 1
Plant	--	--	--	--	-.008	-.039
					(-.06)	(-.25)
Sex	--	-.285**	--	--	.181	--
		(-2.46)			(1.52)	
Age	-.135[2]	-.198	--	--	.071	--
	(-1.22)	(-1.50)			(.59)	
Compounding Location	.086	--	--	--	--	--
	(.75)					
Nightshift	--	.125	--	--	-.025	
		(1.07)			(-.22)	
Size of Household	--	.139	--	.125	--	--
		(1.24)		(.98)		
Number of Incomes per Household	-.089	--	--	.219*	--	--
	(-.77)			(1.79)		
Health Rating	--	-.104	--	--	--	--
		(-.85)				
Relative Wage	--	.237**	--	--	--	--
		(2.07)				
Treated by Doctor	--	--	--	--	-.119	--
					(-1.03)	
Number of Cigarettes	-.320***	--	--	-.202*	.141	-.018
	(-2.88)			(-1.71)	(1.22)	(-.14)
Never Learned About Asbestos	--	-.187*	--	--	--	--
		(-1.69)				
Sick Because of Dust	--	--	.233**	--	-.338***	.108
			(2.20)		(-3.02)	(.77)
# of Others Known Sick Because of Dust	--	.049	--	--	--	.074
		(.38)				(.54)
Faced Danger at Work	--	--	.244**	--	-.167	.604***
			(2.31)		(-1.34)	(4.28)
Union Officer	-.282***	--	--	--	.011	--
	(-2.59)				(.09)	
Number of Inspector Visits	.207*	--	--	.151	--	.229
	(1.91)			(1.19)		(1.61)
Overtime in June	--	.194*	-.105	.063	.175	--
		(1.79)	(-1.01)	(.53)	(1.50)	
Adj. R^2	.227	.206	.125	.096	.229	.417
F	4.47	3.13	4.90	2.45	3.11	5.77
df	6,65	9,65	3,79	5,63	10,61	6,34

* Significantly different from zero for a two-tailed t-test at the .10 level.
** Significant at the .05 level.
*** Significant at the .01 level.
1. Dependent variable of regression equation.
2. t-value in parentheses.

section, women and higher wage earners saw the workplace as relatively safe, and therefore may not have seen working overtime as a tradeoff of risk for greater income. Further, those who have taken greater risks by working more overtime in June were apparently willing to continue taking risks. Finally workers who "never learned about asbestos dangers" were less willing to work overtime. This supports our earlier argument that those who said they "never learned" did know about the risks, but were never formally informed.

The ranking of health and safety as a bargaining issue was higher for respondents who had faced danger at work and/or had been sick because of dust. Experiencing risk apparently made health and safety a more important issue. Heavy smokers were more in agreement with the statement that tougher health and safety regulations will lead to job losses, whereas respondents from multiple income households were significantly more likely to disagree. For these two tradeoff variables, the overwhelming (85-90%) portion of their variation remains unexplained.

The last two equations deal with the hypothetical trade of wages for reduced danger. The respondents' experience with dust-related illness was significant in explaining the "I would trade wages" variable with all other variables controlled. The coefficient for workers reporting dust-related illness is very large, indicating very strong agreement with the statement. Finally, the percentage of wages that a respondent would forego is largely determined by whether the respondent faced danger at work. This single variable explained close to 40% of the variation in the percentage wage variable.

In total, these results again affirm our hypothesis that personal experience with dust-related illness and danger determines one's concern for asbestos dangers and a desire to reduce its attendant health risks.

Our hypotheses concerning age were partly confirmed for the correlational data with older workers being less favourable toward an asbestos ban and less willing to trade wages for greater health protection. These effects were not significant when other exogenous variables were controlled. One of our other major questions was how smokers would react to the tradeoff items. Our data showed that heavier smokers were less worried about asbestos dangers than lighter and non-smokers. The latter two were more willing to make wage tradeoffs for improved health and safety. The hypotheses regarding the effects of wages and family size on tradeoffs were unsupported owing mainly to non-significant correlations. In one case, however, wages were significantly correlated with a tradeoff item, desired overtime, in a direction opposite to that predicted. Thus, some, but certainly not all, of our hypotheses were supported.

We will now turn to the analyses of the interrelations among the endogenous variables. These correlations are presented largely for exploratory purposes, though in one case we will be testing a hypothesis from Chapter 3.

Correlations Among Selected Endogenous Variables

Tables 5.9 and 5.10 summarize the simple correlation coefficients between subsets of behavioural and attitudinal measures. Since we have previously discussed correlations between pairs of variables within a single category, this presentation will be restricted to correlations across categories. We begin with a comparison of composite attitudes[6] about the responsibility system and variables measuring perceived risk, knowledge of rights, and tradeoffs.

TABLE 5.9

Correlations Among Endogenous Variables
Part I

Variables	Union-General	Union-Dust	Mgmt. General	Mgmt. Dust	Joint Dust	Inspector	Safe Level Can Be Set	Equipment-Dust	Can Tell Dust Levels	Would Want Family to Work at Plant
Union-General	1.00									
Union-Dust	.440*** (66)	1.00								
Mgmt.-General	.276** (66)	.434*** (77)	1.00							
Mgmt.-Dust	.237** (68)	.592*** (81)	.580*** (83)	1.00						
Joint-Dust	.185* (61)	.543*** (65)	.510*** (67)	.670*** (68)	1.00					
Inspector	-.114 (62)	.298*** (69)	.384*** (72)	.407*** (73)	.841*** (70)	1.00				
Safe Level Can Be Set	-.010 (61)	-.005 (70)	.141 (75)	.033 (76)	.279** (60)	.366*** (65)	1.00			
Equipment - Dust	.137 (61)	.353*** (69)	.487*** (71)	.388*** (74)	.456*** (60)	.413*** (64)	.266** (68)	1.00		
Can Tell Dust Levels	-.060 (53)	.176* (61)	.217** (65)	.142 (65)	.201* (51)	.121 (55)	.268** (59)	.006 (60)	1.00	
Would Want Family to Work at Plant	.013 (68)	.004 (79)	-.146* (81)	-.301*** (84)	-.244** (68)	-.232** (71)	-.030 (73)	-.360*** (71)	-.125 (63)	1.00
Health Conditions at Plant	.210** (68)	.273*** (77)	.220** (79)	.256** (81)	.186* (68)	.209** (72)	-.030 (72)	.213** (69)	-.015 (63)	-.154* (80)
Knows H & S Rep.	-.266** (70)	.091 (83)	.187** (85)	.275*** (89)	-.233** (68)	.154* (75)	-.166* (78)	.111 (76)	.116 (67)	-.022 (86)
Can Refuse Dangerous Work	.117 (64)	.034 (75)	.191** (76)	.319*** (80)	.243** (64)	.140 (68)	.032 (71)	.277*** (70)	.026 (63)	-.352*** (78)
Tried to Get Tests	-.142 (70)	.013 (82)	.056 (84)	.169* (88)	.210** (70)	.208** (75)	.104 (77)	-.019 (76)	.103 (67)	-.125 (85)
Would Refuse Future Danger	-.064 (67)	.155* (81)	.128 (81)	.125 (85)	.312*** (68)	.319*** (73)	.219** (74)	.244** (72)	.178* (64)	-.146* (82)
Ban Asbestos?	.146 (63)	.181* (73)	.154* (76)	.124 (79)	.126 (63)	.112 (68)	.037 (69)	.174* (68)	.057 (60)	-.172* (75)
Desired Overtime	-.033 (63)	-.051 (76)	-.140 (78)	-.206** (82)	-.142 (64)	-.131 (69)	-.176* (72)	-.253** (71)	-.052 (63)	.232** (79)
Health & Safety Barg. Rank	.228** (69)	.309*** (82)	.254*** (83)	.303*** (88)	.273** (69)	.200** (74)	.275*** (76)	.340*** (74)	-.239** (65)	.012 (84)
Tough H & S Regs. Mean Jobs	.042 (60)	-.032 (69)	-.078 (72)	.126 (74)	.015 (59)	-.065 (63)	.085 (66)	.177* (67)	-.112 (62)	-.071 (71)
I Trade Wages to Remove Danger	-.273** (61)	-.141 (69)	.121 (73)	-.052 (74)	-.316*** (58)	-.233** (63)	.024 (67)	.134 (67)	.072 (60)	.001 (72)
% Wage I Would Give Up	.558*** (35)	.407*** (41)	.007 (42)	.389*** (43)	.461*** (35)	.263* (38)	.088 (37)	-.046 (39)	.068 (37)	-.158 (40)

* Significantly different from zero for a two-tailed test at the .10 level.
** Significant at .05 level.
*** Significant at .01.

TABLE 5.10

Correlations Among Endogenous Variables
Part II

Variables	Health Conditions at Plant	Knows H&S Rep.	Can Refuse Dangerous Work	Tried to Get Tests	Refuse Future Danger	Ban Asbestos	Desired Overtime	H & S Bargaining Rank	Tough H&S Regs. Mean Jobs	I Trade Wages to Reduce Danger
Health Conditions at Plant	1.00									
Knows H & S Rep.	-.014 (83)	1.00								
Can Refuse Dangerous Work	.156* (75)	.023 (82)	1.00							
Tried to Get Tests	.104 (83)	.074 (90)	-.081 (81)	1.00						
Would Refuse Future Danger	-.003 (79)	.229** (87)	-.041 (78)	.149* (86)	1.00					
Ban Asbestos	.171* (75)	-.127 (80)	.080 (73)	-.041 (79)	.102 (76)	1.00				
Desired Overtime	-.083 (76)	.137* (84)	-.190** (77)	.054 (83)	-.059 (80)	-.026 (74)	1.00			
Health & Safety Barg. Rank	.221** (81)	.237** (89)	.137 (80)	-.006 (88)	.032 (86)	.094 (78)	-.229** (82)	1.00		
Tough H & S Regs. Mean Jobs	-.088 (72)	-.048 (76)	.061 (70)	-.125 (76)	.044 (72)	-.023 (68)	.044 (70)	.006 (74)	1.00	
I Trade Wages to Remove Danger	.011 (70)	.116 (76)	.026 (70)	-.180* (75)	-.138 (73)	-.100 (69)	.127 (71)	-.238** (74)	.065 (63)	1.00
% Wage I Would Give Up	.144 (41)	-.036 (44)	.033 (39)	.280** (44)	.360*** (43)	.157 (38)	-.092 (41)	.178 (44)	.019 (40)	-.729*** (43)

* Significantly different from zero for a two-tailed test at the .10 level.
** Significant at .05 level.
*** Significant at .01 level.

Respondents' attitudes about the efficacy of safety equipment and the trend in health conditions at the plant were significantly related to all six attitudes about the parties.[7] The more positive (negative) respondents were about the parties generally, the more positive (negative) were their responses about the safety provided by protective equipment, and the more likely they were to say that plant conditions during the past year have improved (worsened).

Positive attitudes regarding inspectors, the joint committee, and management in its general and its dust-related roles were associated with greater willingness of respondents to have family members work at the plant. Those who believed that safe asbestos dust levels can be set were more positive about the joint committee and inspectors.

The only surprising relationships found here were between three attitudes toward the parties ("management-general," "union-dust," and "the joint committee") and the workers' perceived ability to detect relatively high dust levels. In particular, respondents who said they were able (unable) to perceive dust level variations tended to have more (less) favourable attitudes toward those three groups.

The knowledge variable which was most consistently associated with attitudes about the parties was the ability to name the health and safety representative. Persons correctly identifying the representative were significantly more positive about the joint committee and the union in general, but were significantly more negative about management in general and in its dust-related role, and more negative about government inspectors.

On the other hand, workers who disagreed with the statement that workers could refuse work without penalty (a right guaranteed by the Ontario Occupational Health and Safety Act) also tended to express more

unfavourable attitudes about management (general and dust) and the joint committee. Similarly, respondents who said they would refuse to work if faced with a dangerous situation in the future were also significantly more negative about the union (dust), the joint committee, and inspectors. Finally, workers who never tried to get dust level tests had less favourable attitudes toward the management (dust), the joint committee, and government inspectors.

Attitudes about the parties were generally related to three tradeoff variables. These relationships are of particular interest because we had hypothesized that greater satisfaction with the health and safety system (i.e., favourable attitudes toward the parties) would be associated with less willingness to make wage tradeoffs for health and safety. We stated that workers who believed that the system was working would perceive little need to make such tradeoffs. As predicted, respondents who gave health and safety a high (low) bargaining priority were significantly more negative (positive) about all the parties. Workers who said they would trade wages to remove danger were less favourable toward the union in general, toward the joint committee, and toward inspectors. The larger the percentage of wages that workers said they would forego to reduce asbestos dangers, the more unfavourable were their attitudes about all parties except "management-general." These findings therefore strongly support our hypothesis.

Also in keeping with our hypothesis, workers who approved a law banning asbestos had less favourable attitudes toward the parties, but the correlations were significant only for the "union-dust" and "management-general" attitudes. Workers who desired more overtime were significantly more positive about management's role in dust regulation. Opinions as to whether tougher health and safety regulations would mean

job losses were not significantly correlated with any of the attitudes about the parties. This variable measures the perception of whether a tradeoff exists rather than the willingness to make such a tradeoff; therefore, it is not surprising to find no significant correlations.

There are fewer significant correlations between pairs of variables measuring perceptions of risks and knowledge of rights and protections. Respondents who believed that they cannot refuse dangerous work also felt that safety equipment does not provide adequate protection, would not want a family member to work at the plant, and indicated that health conditions have worsened over the last year. By comparison, those who said they would refuse to work if faced with a future danger were more likely to disagree that a safe level for asbestos can be set, to feel that safety equipment is inadequate, to say they cannot discern variations in dust levels, and would not want a family member to work at the plant. The other significant correlation in this set was that those who knew their health and safety representative were more likely to agree that a safe dust level can be set.

Three tradeoff variables -- the ranking of health and safety as a bargaining issue, the banning of asbestos, and desired overtime -- were significantly associated with most measures of perceived risk. Respondents who had higher health and safety bargaining priorities were less likely to believe that a safe asbestos level can be set or that protective equipment is adequate, but were more likely to believe that they can sense variations in dust levels. Those respondents with higher health and safety priorities believed that plant conditions had worsened during the past year. Workers who favoured a ban of asbestos products also felt that plant conditions had worsened and that equipment was inadequate. In addition, workers favouring a ban would not recommend

that a relative work at their plant. More desired overtime was associated with a stronger belief that safe levels can be set, with a strong belief that safety equipment provides adequate protections, and with a greater willingness to recommend work at the plant to a family member. Additionally, stronger agreement that "tougher regulations mean job loss" was related to a stronger belief in the adequacy of safety equipment.

Finally, there were six significant correlations (out of a possible twenty-four) between knowledge and tradeoff variables. Workers who knew their safety representative gave health and safety a higher bargaining priority, but somewhat contradictorily wanted to work higher levels of overtime. In contrast, those who agreed that they could refuse dangerous work wanted to work less overtime. Workers who had tried to get dust tests were more willing to trade wages for greater health and safety and to give up more wages. Also workers who said they would refuse dangerous work in the future were willing to give up a greater percentage of their wages for health and safety.

Of the 164 distinct correlations between pairs of endogenous variables from different categories, over 60 reached statistical significance at the .10 level or higher. Despite this large number, some trends of association can be identified. Workers with unfavourable opinions about labour, management, and government generally perceived greater risks of asbestos exposure and were more willing to trade income/security for occupational health and safety. This latter relationship had been hypothesized in Chapter 3. Respondents who perceived higher health risks in their work also appeared ready to trade off income for better health protection. Consistent relationships between knowledge variables and the other three categories were not found.

FOOTNOTES TO CHAPTER 5

1. Some other variables were discarded on the basis of early empirical testing. For instance, length of service proved to be inferior to age in its associations with endogenous variables.

2. These measures more closely resemble lagged endogenous variables.

3. Readers are referred to Appendix B at the end of this study for the full wording of questionnaire items.

4. See Appendix D at the end of this study for the correlations among the nineteen exogenous variables.

5. In Table 5.2, the adjusted R^2 is the proportion of variance in the attitude statement explained by the regression equation. When R^2 is multiplied by 100, we obtain the percentage of variance explained.

6. Composite attitudes are all significantly correlated with one another with most coefficients in the 0.4 - 0.5 range.

7. The correlation between "union-general" and "equipment-dust," though positive, misses statistical significance.

CHAPTER 6

CONCLUSIONS

The purpose of our study was primarily to determine how workers perceived the effectiveness of the health and safety system, and what they believed their rights and protections to be. From this, we wanted both to determine the adequacy of workers' knowledge and to assess how effectively the system has imparted that knowledge. We also wanted to know whether workers perceived a degree of risk in their work. Furthermore, we wanted to determine whether workers perceived that health and safety was important absolutely, relative to other aspects of their work, and especially in terms of their willingness to make financial tradeoffs for health and safety improvements. Finally, from the data mentioned above and from respondents' suggestions, we hoped to provide the Royal Commission with insights into the workings of the health and safety responsibility system. We hope that the Royal Commission can use these data to make recommendations which will improve the occupational health of employees of manufacturers of asbestos products.

The data and analyses which we have reported are based largely on responses to standard interview questions. We have, however, tried to incorporate wherever possible the richness of detail and comment which some respondents voluntarily supplied in interviews. There were many freely given comments which helped us to understand workers' attitudes better. With the exception of the workers at Certified Brakes, where both language barriers and potential respondents' fears of government

officials afflicted our sampling, the respondents generally appeared to speak their opinions freely without fear of reprisal. While many respondents spoke openly to their fellow workers about the interviews, we noted that some others were very careful to ensure that their participation in an interview was not public knowledge. The result of this process was a collection of very candid remarks and observations, some of which were summarized in this study as comments for the Royal Commission. We cannot overemphasize the importance of the respondents' considerable efforts in providing these candid and articulate comments.

Because of the sampling problem at Certified, we will summarize these data separately and follow this with a more systematic summary of the general questions outlined at the beginning of this chapter for the combined Abex and Raybestos samples.

The Certified interviews left us with very grave concerns about the lack of communication of health and safety information to employees who lack an adequate knowledge of English. The linguistic diversity of the employees further compounds the problem because there are not even two common languages which would reach all employees. This linguistic diversity not only reduces the possibility of formal communication with workers but also reduces the opportunities for workers to learn about health and safety matters by less formal means. Communication with fellow workers from different linguistic groups is limited, and understanding of English language news media is limited as well. These were two sources of information about asbestos hazards which were fairly frequently cited by Abex and Raybestos workers.

In terms of more formal communication, we found little evidence to suggest that management, the union, or the government had tried to inform workers in languages other than English about health and safety issues

generally and asbestos particularly. The respondents at Certified were more negative about the parties than other workers surveyed. This may be due to the lack of communication rather than any other real differences in the competence of the parties. Nevertheless, one should not dismiss these attitudes on this basis. Failure to communicate with workers, no matter how difficult it may be, is an issue of perceived competence. Indeed, improved communication may be the first step toward giving the parties greater credibility in the eyes of the workers. Lack of communication may also have been responsible for the very small number of respondents from Certified who were able to name their health and safety committee representatives. Furthermore, because the length of service at Certified was much shorter than at the other plants, a lack of knowledge in this and some other areas may be due to less familiarity with the plant, the union, and the people therein.

For the most part, as we have already indicated, our Certified sample over-represented English and Spanish-speaking workers who lived near the plant, who had telephones, and who were more comfortable with officialdom. Our Spanish-speaking interviewer indicated that among those who refused to talk to him were many immigrants who feared reprisals for talking to us. In many instances these employees have come from countries where such fears are genuine, and where one's job and personal security may be affected adversely by 'political involvement' such as that requested for our survey. While we cannot expect the parties to be able to erase a past history of fears of political repression, we feel that this past experience must be considered as yet another communication barrier, distinct from the language problems previously mentioned. Government in particular has to recognize the fears and cynicism of many immigrant workers, even when it is benignly attempting to deal with the

interests and concerns of workers.

Abex and Raybestos Respondents

With a few exceptions Abex and Raybestos workers were similar in demographic characteristics, attitudes, and knowledge. We will, however, briefly review these differences below, and following this, summarize the relations among the questionnaire items.

No women worked in production at Abex; therefore, any differences reported due to the sex of employees were due to differences between Raybestos women and the men from both plants. Women at Raybestos were younger than the men, had shorter service with the company, and worked in "cleaner" areas of the plant, (i.e., stamping, shipping, and quality control). When women were more positive about the parties, or were less likely to know a health and safety representative, these differences may have been due to one or more of the following factors: (a) women experiencing fewer problems with health and safety because they were in the cleaner areas of the plant; (b) women being generally more positive in attitude statements (i.e., a positive response bias); (c) women experiencing a more positive work environment perhaps because they are treated differently than the male employees; or (d) women being isolated from other workers because of their location. Physical isolation may reduce communication and hence information.

Some sex effects were eliminated in the regressions when other demographic factors were controlled. It may be that the bases of sex effects may vary with the particular types of attitudes being considered. We believe, however, that we should not dismiss these sex

effects by citing plausible causes of differences. Women are a small minority of workers at Raybestos. Women may be more positive toward the parties and less informed about their rights and protections only because they are physically isolated in one area of the plant. If this is the case, we would like to see the parties making more efforts to inform women employees about their rights, protections, and potential hazards in the plant.

Another difference in the plants was that Raybestos was undergoing expansion, and hence there had been considerable disruption in the plant due to the building of new facilities. It was clear from one item -- the rating of the improvement or worsening of conditions at the plant-- that the expansion was seen by some workers as an improvement (e.g., new dust collectors were being installed) and by some as a worsening of conditions (e.g., the added noise and dust created by bulldozing equipment). By the same token, some workers believed it was unfair to comment on items relating to conditions and the adequacy of equipment because of the disruption. Thus, we cannot be certain that the attitudes of Raybestos workers would be the same if a steady state of operations had existed. This situation may be reflected in some of the differences we found in perceptions of equipment safety. However, Abex had installed a new dust collection system in 1977; therefore,plant differences may be attributed to completely installed and operating equipment at Abex as compared to not yet completely installed or fully operating equipment at Raybestos.

Further differences in the two plants include Raybestos' past history of health and safety walkouts which would suggest both a greater awareness of, and concern with, health and safety by the union and by workers at that plant.

A final difference in the two plants is their geographic location

with respect to job markets. Peterborough and Lindsay are only about 50 km apart, but Lindsay is a much smaller town with fewer other potential employers than Peterborough. We did not systematically assess respondents' ties to their communities, but in both plants we found respondents who were part-time farmers. These workers would not likely want to move from their communities for other jobs if it meant giving up their farms. Further, we could not determine whether Peterborough actually provided a larger job market although it had a larger number of potential employers. Several of our Peterborough respondents noted a lack of other job opportunities in Peterborough. One respondent stated when asked about looking for other jobs:

> Some people say that you don't have to work here, but Raybestos is the only one hiring. The question answers itself when you look at the economic factors.

A respondent from Lindsay made a similar observation:

> If I didn't have to work here I wouldn't but I couldn't find anything else. It is very difficult to get another job in a small town like Lindsay.

From many such comments of our respondents at both Abex and Raybestos, it is clear that many workers perceive few other job opportunities in their communities. Hence, the ostensible differences in employment opportunities in Peterborough and Lindsay may not in fact exist, and certainly do not exist in the perceptions of our respondents.

The workers at Raybestos and Abex on average agreed with statements that the union, management, and the joint health and safety committee were trying to keep the dust levels down and that the health and safety system was working. Raybestos workers were often more positive about the parties than Abex workers. The respondents were a little less favourable

about the union and management on more general items such as the effectiveness of the union's day-to-day dealings with management and management's running of the plant, and a little less favourable toward their fellow workers' efforts in trying to keep dust levels down. This summary, based on average ratings, should not obscure the fact that the scores often varied considerably. Some workers rated the parties more and some rated them less favourably than the averages indicated.

The perceived risk in the work environment was measured in a number of ways. One way was to assess workers' knowledge of dust-related illnesses. About 50% of Abex and Raybestos workers reported that they knew at least one person who had died of, or who had, a severe dust-related illness such as asbestosis. About 20% of Abex and Raybestos workers reported that they had, or might have, what they thought was a dust-related illness. None of the self-reported illness was cancer or asbestosis; workers reported as dust-related a variety of chronic respiratory illnesses such as bronchitis. In another measure of perceived risk, just over half the workers at Abex and Raybestos said they would not recommend that a family member take a job at the plant; nevertheless, about 40% said they would recommend working at the plant, indicating a somewhat divided opinion. Workers were also fairly divided in their opinions of the efficacy of safety equipment; the averages on these items tended to be in the neutral area. There was a slight agreement, on average, that health and safety conditions had improved over the last year.

Workers' knowledge of rights and protections was assessed through their reports of experiences and knowledge. Over 60% of Abex and Raybestos respondents knew their health and safety committee representatives. About 80% of Abex workers had never tried to find out dust test results. At Raybestos, 40% had never tried. About half the

workers at both plants reported having talked with union and mangement officials about health and safety, and dust hazards were often one of the topics discussed. Almost 20% of respondents said they had faced dust-related dangers at work since January 1, 1981, but only about a quarter of these respondents said they had refused to work. About 45% of all respondents reported they would refuse work in the future if faced with a dust danger. However, workers strongly agreed that they could refuse unsafe work.

We devised several measures of tradeoff including desired overtime, which showed a willingness to increase exposure for premium pay. Abex workers desired an average monthly overtime of 10 hours, and Raybestos workers desired an average of 13 hours. Workers tended to be divided on an attitude statement regarding whether tougher laws would cost some workers their jobs, a measure of the perceived tradeoff of job security for stronger legislation. The average scores on this item were in the neutral area. Workers disagreed, on average, that they would give up wages to be completely free of asbestos dangers. When asked how much they would give up, a few workers indicated they would give up as much as 10-15% of their wages, but the large majority said they could not afford to give up any wages. Certainly in ranking bargaining issues, wages were the most important. Health and safety ranked a distant second issue, with pensions, fringe benefits, other non-monetary items, and job security being ranked further below these. On a final tradeoff question, about 60% of the respondents at Raybestos and Abex said that a proposed law which would ban asbestos manufacturing and products in Ontario by 1985 was a good idea; whereas about 40% said it was not. This statement was further qualified by telling respondents that such a ban would raise the cost of brake products by at least 20%. Workers who agreed with the ban

either supported their views by citing health reasons, environmental reasons, or by stating that there were safe substitutes. Workers who did not agree with the ban supported their views by stating that there were no safe substitutes, by citing costs and/or possible job loss, or by pointing out the need for asbestos' fire retardant qualities.

Thus, while there were consistent attitudes about the parties, there were much less consistent attitudes in the areas of knowledge of rights and protections, perceptions of risks, and tradeoff issues. The complexity of the issues in the thoughts of many respondents can best be understood by referring the reader once again to Tables 4.7 - 4.11 which summarize the statements to the Royal Commission given at the end of the interviews. There were many thoughtful and articulate comments, and often workers placed considerable trust in the Royal Commission on Asbestos to help solve the many problems which they identified and discussed.

The correlations shed some further light on the workers' attitudes and behaviours. We had developed several hypotheses about the relations between the willingness to trade wages for a healthier work environment and other variables. We did find that workers who said they suffered from dust-related illnesses, who had faced extraordinary dangers in the workplace in the last year, or who knew other workers who had dust-related illnesses were more willing to make tradeoffs and perceived the work environment to be less safe. Workers who had more negative attitudes toward the parties and toward the safety of the workplace were also more willing to make tradeoffs. Older workers were more positive toward the parties and were less willing to trade wages for greater health and safety.

In this latter case, we had hypothesized that older workers with

6.10

their greater dust exposure would have less benefit from improved dust levels. We could not determine whether this reasoning was the basis for the correlation. Nevertheless, whatever the reason for the relationship, we feel that the divergence in attitudes between younger and older workers may be important for occupational health if older workers are more influential in determining bargaining issues and related union policies.

Some of our hypotheses were not confirmed. Higher relative wages did not increase the willingness to trade wages for a healthier work environment. Further, a larger household size did not reduce the willingness to make tradeoffs. Although we had no directional hypotheses, we were concerned with the relation between smoking and tradeoff issues. Heavier smokers were generally less willing to trade wages for reduced asbestos exposure.

In addition to these hypothesized relationships, we explored the relations among other variables measured in our study. We found a considerable number of statistically significant correlations in these exploratory analyses indicating a complex set of relations among the variables.

As with most research, some of our questions were answered more satisfactorily than others. We did learn the extent of workers' knowledge and attitudes in a number of areas relating to health and safety. However, we could not always isolate the sources of variability in these attitudes because some demographic variables were confounded and because we could not study the variables over time.

We believe, nevertheless, that we have provided the Royal Commission on Asbestos with considerable data on the attitudes of workers in three friction materials plants. The complexity of the findings reflects, at

6.11

least in part, the complexity of the issues which the Royal Commission must consider.
least in part, the complexity of the issues which the Royal Commission must consider.

APPENDIX A

Certified Brakes -- Health and Safety Articles

ARTICLE XX - SAFETY AND HEALTH

20.01 OBJECTIVE

The parties desire to maintain high standards of safety and health in the plant and agree to co-operate in the continuing objective of eliminating safety and health hazards in order to prevent industrial injury and illness.

20.02 Union Safety Committee

1. The Company will recognize a Union Safety and health committee composed of a chairman and three members.
2. The Union Safety and Health Chairman shall have access to any area of the plant of the Company at any time.
3. Each member of the Union Safety and Health Committee shall notify his foreman before leaving his job for safety and health committee work and shall report to the supervisor of the department involved on his arrival in that department.
4. Every member of the Union Safety and Health Committee shall be afforded time off to transact any legitimate matters pertaining to safety, such as accident investigation, unsafe or unhealthy conditions of equipment, meetings, etc., after proper notice to his Supervisor.
5. The Union Safety and Health Committee shall co-operate with management in developing a safety and health program.

20.03 Employer Safety and Health Committee

The Company shall notify the Union by letter of the names of its representatives on the Employer's Safety and Health Committee.

20.04 Joint Union-Employer Safety and Health Committee Meetings

The members of the Union Safety and Health Committee and of the Company Safety and Health Committee shall together comprise the joint Safety and Health Committee. The joint Safety and Health Committee's function will be to promote safety and environmental hygiene in the plant. The joint Committee shall hold monthly meetings and take up such safety and health complaints as may be brought forth by either the Union or the Company Committee. Each Committee shall advise the other Committee before the meeting of the items it wishes to take up.

20.05 Plant Inspection

Once each month the joint Safety and Health Committee shall inspect the plant or the plants and property of the Company for the purpose of observing the housekeeping in the plant and to seek out unsafe conditions or practices with a view to correcting them. A written report of the findings of the joint Committee shall be compiled and special attention shall be given to repeated items. One copy of this report shall be furnished to the Union.

20.06 Special Safety and Health Meetings

Special Safety and Health Meetings deemed necessary by either the Union or the Company Safety and Health Committee shall be arranged promptly.

Minutes of Safety and Health Meetings

Minutes of all Safety and Health Meetings shall be furnished to the Union by the Company.

20.07 Chemicals, Solvents and Compounds

Where the Company is currently using chemicals, solvents and compounds and when new chemicals, solvents or compounds, etc. are to be introduced, the Company shall promptly inform the chairman of the union Safety and Health Committee what hazards, if any, are involved and what precautions are taken to ensure the safety and health of the employees. The Company shall supply to the chairman of the Union Safety and Health Committee documentary evidence with respect to the hazards and the required precautions. Wherever chemicals are used the Company shall provide showers for the use of the employees. All employees working with chemicals shall be supplied with coveralls free of charge.

Protective Devices, Wearing Apparel and Equipment

The Company shall at its expense furnish protective devices, wearing apparel, supplies and any other equipment necessary to protect employees properly from injury; and the introduction of such devices, apparel, supplies and equipment shall be discussed with the Union Safety and Health Committee in advance with the objective of increased co-operation.

20.08 Safety and Health Disputes

(1) No employee shall be required to work under conditions which are unsafe or unhealthy. An employee who believes that he is being required to work under conditions that are unsafe or unhealthy shall have the right to:

(a) file a grievance at the Second Step of the grievance procedure and the grievance shall be given preferred handling in the grievance and arbitration procedure; or at the option of the employee,

(b) relief from the job, for so long as the unsafe or unhealthy condition, in his opinion, exists, without loss of his right to return to such job, and at management's discretion, assignment to such other employment as may be available in the plant provided, however, that no employee other than communicating the facts relating to the safety of the job, shall take any steps to prevent another employee from working on the job.

(2) If an employee, pursuant to Paragraph (b) of Sub-Section (1) exercises his right to relief from a job he believes to be unsafe or unhealthy, he shall suffer no loss of gross earnings because of the exercise of that right providing it is agreed during the grievance procedure or found by an arbitration board that he acted reasonably.

APPENDIX B

THE QUESTIONNAIRE

PRE-RECORD 1-5, FILL IN BOXES WHERE REPONSE IS PRECODED, OTHERWISE WRITE OUT ANSWERS

[Intro to study goes here]

1. Plant code: Abex = 1; Ray-Man = 2; Royal = 3 / /

2. Respondent number: Jamie 1-200, Rosemary 201-400, Carol 401-600, Gene 601-800, Sally 801-999 / / / /

3. Interviewer: Jamie = 1, Rosemary = 2, Carol = 3, Gene = 4, Sally = 5 / /

4. Respondent's sex: Male = 1, Female = 2 / /

[Interview language probe goes here if not done for first contact.]

5. Language(s) of interview / / / / /

a. spoken _____

b. read _____

Before we begin on the questionnaire, I would like to tell you about our study. The Ontario Royal Commission on Asbestos has asked Carleton University to do an independent study on worker attitudes in the asbestos industry. Your answers to the questions in the survey will be totally confidential - not even my supervisor will be able to match your name to your answers. When all the data has been collected, we will provide summaries of the data to union and management - these summaries in no way indicate the answers of any individual.

The questionnaire will take approximately twenty minutes to complete. I will read each question to you and record your answer. If there is any question you would rather not answer, please ask me to go on to the next question. The data we collect from yourself and the other workers we interview will be used by the Royal Commission to help it make recommendations to the Ontario Government.

Now, I'd like to begin the interview ...

"Now I'd like to ask you a few general questions about you and your work here at [plant name]."

6. "What year were you born?" / / /

[Calculate age later for boxes; other reply:]

_____

7. "What language or languages do you usually speak at home?" / /

Eng = 1; Fr = 2; Span = 3; Ital = 4; Port = 5;

If other or more than one record here: Probe:

"Are there any other languages you speak at home?" _____

8. "What is your job title?" /__/__/__/

____

"What is the level [or grade] of your job?"______________________

____

9. "How long have you been a/an [job title, level] for [company name]?"______________________ /__/__/

[Probe] "That would be how many years?" ___ ___ or "that would be since 19___?"

10. "How long have you worked for [company name] altogether?"
______________ /__/__/

[Probe] "That would be since 19____?" or "That would be how many years?"__________________

11. "Have you ever worked for any other company or companies where asbestos or other dust was in the air?" Yes/___/ No/___/

<u>If yes</u>

Beginning with the most recent company, would you please tell me:

a. the company (or employer) name ______________________
b. where was the company located ______________________
City Prov. Country
c. how long did you work there? Years:_______ Months:_______
d. what type of dust was there? ______________________
e. Did you work in an area where you were exposed to dust? Yes__________ No__________
f. Did you work for any other companies? Yes__________ No__________

a. the company (or employer) name ______________________
b. where was the company located ______________________
City Prov. Country
c. how long did you work there? Years:_______ Months:_______
d. what type of dust was there? ______________________
e. Did you work in an area where you were exposed to dust? Yes__________ No__________
f. Did you work for any other companies? Yes__________ No__________

a. the company (or employer) name ______________________
b. where was the company located ______________________
City Prov. Country
c. how long did you work there? Years:_______ Months:_______
d. what type of dust was there? ______________________
e. Did you work in an area where you were exposed to dust? Yes__________ No__________
f. Did you work for any other companies? Yes__________ No__________

a. the company (or employer) name ______________________
b. where was the company located ______________________
City Prov. Country
c. how long did you work there? Years:_______ Months:_______
d. what type of dust was there? ______________________
e. Did you work in an area where you were exposed to dust? Yes__________ No__________
f. Did you work for any other companies? Yes__________ No__________

12. "What part of the plant do you work in now?" /___/___/

_____

[If not a standard answer, probe] "Is that the [most likely standard] part?"_____

[If still no standard, probe for each standard part] "Then is it the [name 1, name 2, name 3....or name n] part?"_____

13. "What shift do you usually work?" /___/___/
Day = 1, Ev = 2, Nite = 3

Other response:_____

14. "How many hours of overtime did you work in June?" /___/___/
[Record number] Other reply:_____

_____

15. "If you had the chance, how many hours of overtime would you like to work each month? /___/___/
[Record number]

Other reply:_____

_____

16. "How many people do you support on your wages?" /___/___/

Probe: "That would be how many adults?"_____

and how many children?_____

Other reply:_____

_____

17. "Do any other people help with the support of these [#] adults and children?" No = 0; [If yes, record] /___/___/

"How many_____?" Other reply or clarification:_____

_____

_____

18. "Have you applied for any positions with another company during the last year?" Yes = 1 No = 2 /___/___/

Other reply:_____

_____

If yes

"What type of work did you apply for? /___/___/

_____

"Was this company in the asbestos industry? /___/

19. a) Name a worker health and safety rep who works on your shift.

19. a) **Name a worker health and safety rep who works on your shift.**

_____

b) How many union meetings have you attended since January?

b) **How many union meetings have you attended since January?**

_____

20. In the last three years have you been a union officer or on a committee for your union? Yes/___/ No/___/

20. **In the last three years have you been a union officer or on a committee for your union?** Yes/___/ No/___/

List position(s) now held. _____

List position(s) now held. _____

_____

_____

21. "Would you rate your physical health as [show card] /___/

21. **"Would you rate your physical health as [show card]** /___/

very good (1)
good (2)
fair (3)
poor (4)
very poor (5)
can't say (6)

Other reply: _____

Other reply: _____

_____

_____

a. Have you been treated by a doctor for any illness or injury during the last year? /___/

a. **Have you been treated by a doctor for any illness or injury during the last year?** /___/

Yes = 1; No = 2; Can't say = 3

If yes

If yes

b. What were you treated for?

b. **What were you treated for?**

1. _____ 4. _____
2. _____ 5. _____
3. _____ 6. _____

[Probe] "Did you see a doctor about anything else?" _____

[Probe] "Did you see a doctor about anything else?" _____

_____

_____

22. a) "How many cigarettes did you smoke yesterday?" /___/___/

22. a) **"How many cigarettes did you smoke yesterday?"** /___/___/

Other reply: _____

Other reply: _____

b) "Did you smoke any cigars, cigarillos or pipes of tobacco?" /___/ No/___/

b) **"Did you smoke any cigars, cigarillos or pipes of tobacco?"** /___/ No/___/

Yes = 1; No = 2; Can't Say = 3

Other reply: _____

Other reply: _____

c) If non-smoker now [Probe]

c) **If non-smoker now** [Probe]

"Did you ever smoke?" Yes/___/ No/___/

"Did you ever smoke?" Yes/___/ No/___/

d) If yes [Probe]

d) **If yes** [Probe]

"When did you quit smoking" _____

"When did you quit smoking" _____

"Why did you quit?"

"Why did you quit?"

_____

_____

_____

_____

_____

_____

23. "When this contract is up, what will be the most important bargaining issue for you?"

"What is the second most important issue?"

"What is the third most important issue?"

"What is the fourth most important issue?"

"Are there any other issue(s)?"

24. "I have here several statements about your union and management. I am going to read a statement and then ask you to tell me which opinion on this card best applies to you [show card]. The choices are [read items]. Now here is the first statement:"

_____	Strongly agree	(1)
_____	Mildly agree	(2)
_____	Don't agree or disagree	(3)
_____	Mildly disagree	(4)
_____	Strongly disagree	(5)
_____	Can't say	(6)

Read statements and record response code:

a. Overall, the union here does a good job for me in dealing with management when the contract is up. /___/

b. Overall, the management here does a good job in running the plant. /___/

c. Overall, the union here does a good job for me in day to day dealings with management. /___/

d. Overall, the management here does a good job in giving me good working conditions. /___/

[Keep card out]

25. "Here are some more statements about your health and safety. Once again I would like you to give the opinion that best applies to you. [Show card]

_____	Strongly agree	(1)
_____	Mildly agree	(2)
_____	Don't agree or disagree	(3)
_____	Mildly disagree	(4)
_____	Strongly disagree	(5)
_____	Can't say	(6)

Read statements and record response code:

a. Management here cares about workers' health and safety. /___/

b. I care about my health and safety at work. /___/

c. The union gets management to follow health and safety regulations. /___/

d. The joint health and safety committee here does a good job. /___/

e. Current laws about workers' health and safety are not good enough. /___/

f. Government inspectors enforce health and safety regulations. /___/

g. Management here does its best to keep dust levels down at work. /___/

h. The union does its best to keep dust levels down at work. /___/

i. My fellow workers do their best to keep dust levels down at work. /___/

j. The joint health and safety committee does its best to keep dust levels down at work. /___/

26. "Who should be responsible for health and safety in your plant?"

_____

_____

[Probe] "Can you think of some person, some group of people, or some agency that should be responsible for health and safety in your plant?"

_____

_____

27. "Since January 1 of this year how many visits of health and safety inspectors to this plant do you know of?"_____

_____

28. "Who would you say that government inspectors generally care most about?" [Show card and read items] /___/

_____

_____

_____

_____

_____

[Probe] "Would you say they care more about the workers, the bosses, or someone or something else?"_____

_____

_____

29. "I am now going to make some statements about things related to the health and safety conditions in your work. Would you please tell me if you agree with these statements by showing me which answer applies to you." [Show card]

_____	Strongly agree	(1)
_____	Mildly agree	(2)
_____	Don't agree or disagree	(3)
_____	Mildly disagree	(4)
_____	Strongly disagree	(5)
_____	Can't say	(6)

[Read statements and record response code:]

a. A safe dust level can be set for the asbestos industry. /___/

If agreed [Probe] "What is the safe level?_____

_____

If other response [probe] "Why did you say that?"_____

_____

_____

b. In (our) this plant, workers can refuse to do dangerous work without financial or other penalty. /___/

c. Tougher health regulations in the asbestos industry will cause some workers to lose their jobs. /___/

d. The safety clothing and equipment which I am given to use in this plant protects me from all asbestos dangers. /___/

e. The ventilation [air cleaning] system here keeps the dust at a safe level. /___/

f. Even when I can't see the dust, I can tell when dust levels are higher than normal. /___/

g. I would give up some of my wages if the plant could be made completely safe from asbestos dangers. /___/

If agreed [Probe] "What per cent of your pay would you be willing to give up?"_____

If other reply, record comments:_____

_____

_____

h. I would tell a member of my family to take a job at this plant. /___/

30. "Compared to last August, health and safety conditions in this plant have

____ greatly improved (1)
____ slightly improved (2)
____ not changed (3)
____ slightly worsened (4)
____ greatly worsened (5)
____ can't say (6)

If change [Probe] "Could you tell me why you said conditions [improved or worsened]?"_____

_____

_____

If change [Probe] "Who or what caused the change?"

_____

_____

31. "Where and when did you learn about the dangers of asbestos?"_____

_____

_____

_____

_____

_____

_____

_____

32. "Some studies show that asbestos affects peoples' health. The Ontario Federation of Labour has therefore said that there should be a law stopping the making and selling of asbestos products by 1985. Substitutes for asbestos exist, but they would raise the costs of brake linings by at least 20%.

Do you think such a law is a good idea? /___/
Yes = 1; no = 2; Can't say = 3

Why or why not?_____

_____

_____

33. "Have you ever spoken to your boss or other company people about the problems of asbestos dust in your work?" /___/
Yes = 1; no = 2; can't say = 3

Other reply:_____

_____

If yes [Probe]

a. What did you speak about?_____

_____

_____

b. "How was your problem solved [or question answered]?"_____

_____

_____

c. "Was the person you talked to on the joint health and safety committee? Yes = 1; no = 2; can't say = 3 /___/

Other reply:_____

_____

34. "Have you ever spoken to your union representative or other union people including worker safety reps about the problems of asbestos dust in your work?" /___/
Yes = 1; no = 2; can't say = 3

Other reply:_____

_____

If yes [Probe]

a. "Who did you speak to?"_____

_____

[Probe] "What role did s/he have in the union?"_____

_____

b. What did you speak about?_____

_____

_____

c. "How was your problem solved [or question answered]?"_____

_____

_____

35. "Have you ever spoken to a government inspector or other government people about the problems of asbestos dust in your work?" /___/
Yes = 1; no = 2; can't say = 3

Other reply:_____

_____

If yes [Probe]

a. What did you speak about?_____

_____

_____

b. "How was your problem solved [or question answered]?"_____

_____

_____

36. "Have you ever tried to find out the results of dust tests in the plant?" Yes = 1; No = 2; Can't say = 3 /___/

a. If yes,

"Did you find the results? Yes = 1; No = 2; Can't say = 3 /___/

b. If no,

"Why didn't you get the results?_____

_____

37. "Do you know of any people in your plant who are or were sick because of dust at work? Yes = 1; No = 2; Can't say = 3 /___/

Other reply:_____

_____

a. If yes,

"How many people do you know of?" /___/

Could you tell me, for each one you know, what kind of sickness they have or had?

1._____ /___/

2._____ /___/

3._____ /___/

4._____ /___/

5._____ /___/

38. "Have you ever been sick because of dust at work?" /___/

____ Yes (1)
____ No (2)
____ Maybe (3)
____ Don't know (4)

a. If yes
"What kind of sickness did/do you have?_____

_____

39. "Since January 1, have you ever been faced with any dangerous work situation?"

____ Yes (1) /___/
____ No (2)
____ Don't remember (3)
____ Can't say (4)

a. If yes

"How many times?"_____ /___/

For each occasion, "what type of danger"

1._____ /___/

2._____ /___/

3._____ /___/

4._____ /___/

5._____ /___/

b. From above, for any danger involving dust, what was the source of the dust?_____

_____

c. What did you do?_____

_____

_____

d. When and how was the problem fixed?_____

_____

_____

40. If you felt the dust levels in your work area were too high the next time you were at work, what would you do?

_____

_____

_____

_____

41. "Have you ever attended any special meetings, workshops, or courses on occupational health?
Yes = 1; No = 2; Don't remember = 3 /___/

If yes

"How many?_____ and for each one

when_____

sponsor_____

duration_____

topics_____

when_____

sponsor_____

duration_____

topics_____

when_____

sponsor_____

duration_____

topics_____

when_____

sponsor_____

duration_____

topics_____

42. "You have answered all my questions. Now you have the chance to tell the Royal Commission anything you feel it should know. I'll write down any things you have to say and make sure the Commission gets your comments. So, is there anything else that you would like me to tell the Royal Commission?

_____

_____

_____

_____

_____

_____

_____

_____

APPENDIX C

Detailed Description of Coded Data

Name	Variable Label	Value Labels	Card Col.	Sources and Comments
1. PLANT	--	1 - Abex 2 - Raybestos 3 - Certified	1 - 1 2 - 1	1. Plant code: Abex = 1; Ray-Man = 2; Cert. = 3
2. ID	--	--	1-2,3,4 2-2,3,4	2. Respondent number: Jamie 1-200, Rosemary 201-400 Carol 401-600, Gene 601-800 Sally 801-999, Luis 901-999
3. SEX	--	0 - Female 1 - Male 9 - Missing	1 - 5	4. Respondent's sex: Male = 1, Female = 2
4. LANG	--	0 - English 1 - Other	1 - 6	5. Language(s) of interview a. spoken_____ b. read
5. AGE	--	Age 99- Missing	1 - 7,8	6. "What year were you born?" [Calculate age later for boxes; other reply: _____] If respondent refused to answer, no age estimates were recorded.
6. WAGE	Hourly Wage as of August, 1981	Wage .99 - Missing .98 - Uncodeable	1 - 9,10, 11,12	8. "What is your job title?" "What is the level [or grade] of your job?" - Wage was derived from response - based on job title and collective agreement as of April 20, 1981
7. SERVICE	--	Months	1 - 13,14 15	10. "How long have you worked for [company name] altogether?"_____ [Probe] "That would be since 19__?" - Response to these questions was converted into months of employment with the company
8. DUST	--	0 - No 1 - Yes,1 2 - Yes,2 3 - Yes,3+ 4 - Uncertain 9 - Missing	1 - 16	11. "Have you ever worked for any other company or companies where asbestos or other dust was in the air?" Yes/____/ No/____/ If yes Beginning with the most recent company would you please tell me: a. the company (or employer) name _____ b. where was the company located _____ City Prov. Country c. how long did you work there? Years:_____ Months:_____ d. what type of dust was there? _____ e. did you work in an area where you were exposed to dust? Yes _____ No _____ f. did you work for any other companies? Yes _____ No _____ Repeated until answer was No for Question f.

Name	Variable Label	Value Labels	Card Col.	Sources and Comments
9. LOCATION	--	0-mixing, compounding 1-preforming 2-ovens 3-drilling, grinding & polishing 4-inspecting, printing shipping 5-general maintenance 6-other categories 8-uncodeable 9-missing	1-17	12. "What part of the plant do you work in now" / / / [If not a standard answer, probe] "Is that the [most likely standard] part?" [If still no standard, probe for each standard part] "Then is it the [name 1, name 2, name 3 .... or name n] part?"
10. SHIFT	--	1-day 2-evening 3-night 4-swing 8-uncodeable 0-missing	1-18	13. "What shift do you usually work?" / / / Day = 1, Ev = 2, Nite = 3 Other response:
11. OTJUNE	--	hours 97-don't know 98-uncodeable 99-missing	1-19,20	14. "How many hours of overtime did you work in June?" / / / [Record number] Other reply:
12. OTDES	--	hours 40-all I can get 96-more/none according to the season 97-don't know 98-uncodeable 99-missing	1-21,22	15. "If you had the chance, how many hours of overtime would you like to work each month? / / / [Record Number] Other reply:
13. HHNO	--	number of people including self within or outside the household	1-23,24	16. "How many people do you support on your wages?" / / / Probe: "That would be how many adults?" and how many children? Other reply:
14. HHINC	--	0-no other 1-part-time spouse or equivalent 2-full-time spouse or equivalent 3-1 full-time and 1 part-time or more 8-uncodeable 9-missing	1-25,26	17. "Do any other people help with the support of these [#] adults and children?" No = 0; [If yes, record] / / / "How many_____?" Other reply or clarification - Summer jobs of children excluded.

Name	Variable Label	Value Labels	Card Col.	Sources and Comments
15. OJOB	--	0-no 1-yes 9-missing	1-27	18. "Have you applied for any positions with another company during the last year?" Yes = 1, No = 2 / / / Other reply: _____
16. OJOBTYPE	--	0-not applicable 1-asbestos industry 2-chemical or dust related industry 3-other	1-28	If yes "What type of work did you apply for? / / / _____ "Was this company in the asbestos industry?" / / /
17. HSREP	--	0-could't name, don't know 1-named one or more correctly 2-named someone incorrectly 8-uncodeable 9-missing	1-29	19. a) Name a worker health and safety rep who works on your shift. _____
18. UMEET	--	number of meetings attended 96-can't say 97-refused 98-uncodeable 99-missing	1-30	19. b) How many union meetings have you attended since January? _____
19. OFFICER	--	0-no 1-yes, 1 office 2-yes, 2 3-Yes, 3+ 6-missing	1-32	20. In the last three years have you been a union officer or on a committee for your union? Yes/ / No/ / List position(s) now held. _____
20. HEALTH	--	1-very good 2-good 3-fair 4-poor 5-very poor 6-don't know 7-refused 8-uncodeable 9-missing	1-33	21. "Would you rate your physical health as [show card] / / very good (1) good (2) fair (3) poor (4) very poor (5) can't say (6) Other reply: _____

Name	Variable Label	Value Labels	Card Col.	Sources and Comments
21. DOC	--	0-no 1-yes 6-can't say 7-refused 8-uncodeable 9-missing	1-34	21 a. Have you been treated by a doctor for any illness or injury during the last year? Yes = 1; No = 2; Can't say = 3 / / /
				If yes 21 b. What were your treated for? 1._____ 4._____ 2._____ 5._____ 3._____ 6._____ [Probe] "Did you see a doctor about anything else?"_____
22. ILL1 23. ILL2 24. ILL3 25. ILL4 26. ILL5 27. ILL6 28. ILL7 29. ILL8 30. ILL9	minor respiratory major respiratory breaks and sprains heart psychological skin eye, ear other internal	0-not mentioned 1-mentioned 9-not applicable due to refusal, missing or other reasons	1-35 1-36 1-37 1-38 1-39 1-40 1-41 1-42	ILL1-minor respiratory illnesses included colds, cough, bronchitis and tonsilitis. ILL2-included pneumonia, pleurisy, emphysema, asbestosis, lung cancer and other major lung diseases. ILL6-included back problems. ILL7-includes injuries to eyes and ears. ILL9-included in these unclassified were nerve problems in neck and hands.
31. NCIGS	--	number of cigarettes 96-can't remember 97-refused 98-uncodeable 99-missing	1-44 1-45	22 a. "How many cigarettes did you smoke yesterday?" / / / Other reply:_____
32. OSMOKE	--	0-no 1-yes 6-can't remember 7-refused 8-uncodeable 9-missing	1-46	22 b. "Did you smoke any cigars, cigarillos or pipes of tobacco?" Yes = 1; No = 2; Can't Say = 3 Yes/ / No/ / Other reply:_____
33. QUIT	--	0-still smoke 1-nonsmoker 2-general health 3-asbestos 4-social/personal 5-cost 6-other reasons 7-refused 8-uncodeable 9-missing	1-48	22 c. If non-smoker now [Probe] "Did you ever smoke?" Yes/ / No/ / 22 d. If yes [Probe] "When did you quit smoking?"_____ "Why did you quit?"_____

Name	Variable Label	Value Labels	Card Col.	Sources and Comments
34. ISSUE1	Wages/Cola	0-not mentioned	1-49	23. "When this contract is up, what will be the most important bargaining
35. ISSUE2	Pension	5-most important	1-50	_____
36. ISSUE3	Fringes	4-2nd most important	1-51	"What is the second most important issue?"
37. ISSUE4	Health and Safety	3-3rd	1-52	_____
38. ISSUE5	Job Security	2-4th	1-53	"What is the third most important issue?"
39. ISSUE6	Other Nonmonetary	9-missing	1-54	_____
				"Are there any other issue(s)?" _____
				- ISSUE5 - Job security included references to technological change and retraining.
				- ISSUE6 - Nonmonetary included references to union security, work rules, and grievance procedure.
40. AT1	Union good on contract.	1. strongly agree	1-55	24. "I have here several statements about your union and management. I am going to read a statement and then ask you to tell me which opinion on this card best applies to you [show card]. The choices are [read items]. Now here is the first statement:"
41. AT2	Mgmt. good at running plant.	2. mildly agree	1-56	
42. AT3	Union good day-to-day.	3. neither	1-57	
43. AT4	Mgmt. good working conditions.	4. mildly disagree	1-58	_____ Strongly agree (1)
44. AT5	Mgmt. cares health and safety.	5. strongly disagree	1-59	_____ Mildly agree (2)
45. AT6	I care about my H & S.	6. can't say	1-60	_____ Don't agree or disagree (3)
46. AT7	Union gets mgmt. to follow H & S rules.	9. missing	1-61	_____ Mildly disagree (4)
47. AT8	Joint H & S good job.		1-62	_____ Strongly disagree (5)
48. AT9	Laws not good enough.		1-63	_____ Can't say (6)
49. AT10	Inspectors enforce regulations.		1-64	
50. AT11	Mgmt. keeps dust down.		1-65	
51. AT12	Union keeps dust down.		1-66	
52. AT13	Fellow workers keep dust down.		1-67	25. a. Overall, the union here does a good job for me in dealing with management when the contract is up.
54. AT14	Joint H & S dust down.		1-68	b. Overall, the management here does a good job in running the plant.
				c. Overall, the union here does a good job for me in day-to-day dealings with management.
				d. Overall, the management here does a good job in giving me good working conditions.
				a. Management here cares about workers' health and safety.
				b. I care about my health and safety at work.
				c. The union gets management to follow health and safety regulations.
				d. The joint health and safety committee here does a good job.
				e. Current laws about workers' health and safety are not good enough.
				f. Government inspectors enforce health and safety regulations.
				g. Managment here does its best to keep dust levels down at work.
				h. The union does its best to keep dust levels down at work.
				i. My fellow workers do their best to keep dust levels down at work.
				j. The joint health and safety committee does its best to keep dust levels down at work.

Name	Variable Label	Value Labels	Card Col.	Sources and Comments
55. HSRES1	Everyone/myself	0-not mentioned	1-70	26. "Who should be responsible for health and safety in your plant?"
56. HSRES2	Union	1-mentioned	1-71	
57. HSRES3	Workers	9-missing, refused	1-72	
58. HSRES4	Management	or invalid	1-73	
59. HSRES5	Government		1-74	[Probe] "Can you think of some person, some group of people, or some
60. HSRES6	H & S Committee		1-75	agency that should be responsible for health and safety in your plant?"
61. NVISITS	--	number of visits	1-78	27. "Since January 1 of this year how many visits of health and safety
		96-saw people but uncertain	1-79	inspectors to this plant do you know of?"
		97-refused		
		98-uncodeable		
		99-missing		

Name	Variable Label	Value Labels	Card Col.	Sources and Comments
1. PLANT2	--	1-Abex 2-Raybestos 3-Certified	2-1	Plant Code: Abex = 1; Ray-Man = 2; Certified = 3
2. ID2	--	--	2-2,3,4	Respondent number: Jamie 1-200, Rosemary 201-400 Carol 401-600, Gene 601-800 Sally 801-999
3. INCARE1 4. INCARE2 5. INCARE3 6. INCARE4	Workers/myself Management Themselves Public/Gov't.	0-not mentioned 1-mentioned 6-can't say 7-refused 8-uncodeable 9-missing	2-5,6,7,8	28. "Who would you say that government inspectors generally care most about?" [Show card and read items] / / / [Probe] "Would you say they care more about the workers, the bosses, or someone or something else?
7. AT15	Safe level can	1-Sagree 2-Magree 3-neither 4-Mdisagree 5-Sdisagree 6-can't say 7-refused 8-uncodeable 9-missing	2-9	29 a. A safe dust level can be set for the asbestos industry.
8. SAFEDUST	--	0-no safe level 1-gave 2F-CC lmt. 2-gave less than 2F-CC limit 3-gave greater than 2F-CC limit. 4-can't remember 6-9 as above	2-10	If agreed [Probe] "What is the safe level?" If other response [Probe] "Why did you say that?"
9. AT16 10. AT17 11. AT18 12. AT19 13. AT20 14. AT21	No penalty refusal. HS regulations job loss. Safety equip. protects. Air sys. safe dust. Can tell unsafe. Trade wages.	1-Sagree 2-Magree 3-neither 4-Mdisagree 5-Sdisagree 6-9 as above	2-12 2-13 2-14 2-15 2-16 2-17	29 b. In (our) this plant, workers can refuse to do dangerous work without financial or other penalty. / / c. Tougher health regulations in the asbestos industry will cause some workers to lose their jobs. / / d. The safety clothing and equipment which I am given to use in this plant protects me from all asbestos dangers. / / e. The ventilation [air cleaning] system here keeps the dust at a safe level. / /

(Continued on next page)

Name	Variable Label	Value Labels	Card Col.	Sources and Comments
				29 f. Even when I can't see the dust, I can tell when dust levels are higher than normal. / /
				g. I would give up some of my wages if the plant could be made completely safe from asbestos danger. / /
15. PERGIVE	--	% of wages 95-can't afford to 96-uncertain 97-refused 98-uncodeable 99-missing	2-19,20	If agreed [Probe] "What per cent of your pay would you be willing to give up?" _____ If other reply, record comments: _____
16. AT22	Family member works here	0-no 1-yes 5-maybe 6-9 as above	2-21	20 h. I would tell a member of my family to take a job at this plant. / /
17. CONDITIO	--	1-greatly improved 2-slightly improved 3-not changed 4-slightly worsened 5-greatly worsened 6-can't say	2-22	30. "Compared to last August, health and safety conditions in this _____ greatly improved (1) _____ slightly improved (2) _____ not changed (3) _____ slightly worsened (4) _____ greatly worsened (5) _____ can't say (6) If change [Probe] "Could you tell me why you said conditions [improved or worsened]?" _____
18. CHANGE1	Plant Expansion.	0-no mention 1-mentioned 2-not applicable 6-can't say 7-refused 8-uncodeable 9-missing	2-24 2-25 2-26 2-27 2-28 2-29	If change [Probe] "Who or what caused the change?"
19. CHANGE2	Union Action.			
20. CHANGE3	Management Action.			
21. CHANGE4	H & S Comm. Action.			
22. CHANGE5	Indiv. Action.			
23. CHANGE6	Gov't. Action.			
24. LEARN1	Media.	same as above	2-31	31. "Where and when did you learn about the dangers of asbestos?"
25. LEARN2	Personnel		2-32	
26. LEARN3	Medical exam at plant.		2-33	
27. LEARN4	Fellow workers.		2-34	
28. LEARN5	Union.		2-35	
29. LEARN6	H & S Committee.		2-36	
30. LEARN7	Government		2-37	
31. LEARN8	Never learned about danger.		2-38	

Name	Variable Label	Value Labels	Card Col.	Sources and Comments
31. LAWGOOD	--	0-no 1-yes 6-can't say 7-refused 8-uncodeable 9-missing	2-39	32. "Some studies show that asbestos affects peoples' health. The Ontario Federation of Labour has therefore said that there should be a law stopping the making and selling of asbestos products by 1985. Substitutes for asbestos exist, but they would raise the costs of brake linings by at least 20%. Do you think such a law is a good idea? / / Yes = 1; No = 2; Can't Say = 3 Why or why not?_____
32. LAW1 33. LAW2 34. LAW3 35. LAW4 36. LAW5 37. LAW6 38. LAW7 39. LAW8	Health Danger No Safe Substitutes Lose Jobs; Costly Remove Danger Fibreglass No Better Tech. Change/Asbestos Obsolete Social/Environ. Costs Asbestos is Unavoidable	0-no mention 1-mention 6-can't say 7-refused 8-uncodeable 9-missing	2-40 2-41 2-42 2-43 2-44 2-45 2-46 2-47	32.*The question in this form was used for interviews at Raybestos-Manhattan and Abex Industries Ltd. The question was reworded for interviews at Certified Brake due to concerns about the wording, expressed by management. The question was revised to read as follows: "Some Studies show that asbestos affects peoples' health. The Ontario Federation of Labour has therefore said that there should be a law stopping the making and selling of asbestos products by 1985. Do you think such a law is a good idea? / / Yes = 1; No = 2; Can't Say = 3 Why or why not?_____
40. TKBOSS	--	0-no 1-yes 6-can't say 7-refused 8-uncodeable 9-missing	2-49	33. "Have you ever spoken to your boss or other company people about the problems of asbestos dust in your work? / / Yes = 1; No = 2; Can't Say = 3 Other reply:_____
41. BOSSTOPI	--	0-asbestos related 1-other health and safety 2-not applicable 6-9 as above	2-50 2-51	a. What did you speak about?_____ b. "How was your problem solved [or question answered]?"_____
42. BOSSHS	--	0-no 1-yes 2-not applicable 6-9 as above		c. "Was the person you talked to on the joint health and safety committee?" Yes = 1; No = 2; Can't Say = 3 / / Other reply:_____

Name	Variable Label	Value Labels	Card Col.	Sources and Comments
43. TKUN	--	0-no 1-yes 6-9 as above	2-53	34. "Have you ever spoken to your union representative or other union people including worker safety reps about the problems of asbestos dust in your work?" / / Yes = 1; No = 2; Can't Say = 3 Other reply:_____
44. UNTOPI	--	0-asbestos related 1-other health and safety 2-not applicable 6-9 as above		If yes [Probe] a. "Who did you speak to?"_____ [Probe] "What role did s/he have in the union?"(i.e. was s/he on the health and safety committee)_____ _____
45. UNHS		0-no 1-yes 2-not applicable		b. "What did you speak about?"_____ _____ c. "How was your problem solved [or question answered]?"_____ _____
46. TKGOVT	--	0-no 1-yes 6-can't say 7-refused 8-uncodeable 9-missing	2-56	35. "Have you ever spoken to a government inspector or other government people about the problems of asbestos dust in your work? / / Yes = 1; No = 2; Can't Say = 3 Other reply:_____
47. GOVTOPIC	--	0-asbestos related 1-other health and safety 2-not applicable 6-9 as above	2-57	If yes [Probe] a. "What did you speak about?"_____ _____ _____ b. "How was your problem solved [or question answered?"_____ _____

Name	Variable Label	Value Labels	Card Col.	Sources and Comments
48. TESTS	--	0-never tried 1-tried and was refused 2-tried and didn't get for other reasons 3-tried and did get 4-assume they are available 5-get them but don't understand them 6-9 as above	2-58	36. "Have you ever tried to find out the results of dust tests in the plant?" Yes = 1; No = 2; Can't Say = 3 / / a. If yes, "Did you find the resuts? Yes = 1; No = 2; Can't Say = 3 / b. If no, "Why didn't you get the results?" _____
49. OSICKDUS	--	0-no 1-yes,1 2-yes,2 3-yes 3 6-can't say 7-refused 8-uncodeable 9-missing	2-59	37. "Do you know of any people in your plant who are or were sick because of dust at work"? Yes = 1; No = 2; Can't Say = 3 / / Other reply: _____ _____ a. If yes, "How many people do you know of?" / /
50. OSICK1 51. OSICK2 52. OSICK3	Asbestos (Silicosis) Cancer Other Respiratory	0-not known 1-know of 6-9 as above	2-60 2-61 2-62	Could you tell me, for each one you know, what kind of sickness they have or had? 1. _____ / / 2. _____ / / 3. _____ / / 4. _____ / / 5. _____ / / - Variable label respiratory includes emphysema, asthma, bronchitis, and other chronic respiratory illnesses.
53. SELFDUST	Self Illness Due to Dust	0-no 1-yes .5-maybe 6-9 as above	2-64	38. "Have you ever been sick because of dust at work?" / / _____ Yes (1) _____ No (2) _____ Maybe (3) _____ Don't Know (4)

Name	Variable Label	Value Labels	Card Col.	Sources and Comments
54. DUSTILL1	Asbestos (Silicosis)	0-no mention	2-65	Re: Preceding Question.
55. DUSTILL2	Cancer	1-mention	2-66	
56. DUSTILL3	Other Respiratory	2-not applicable 6-9 as above	2-67	38 a. If yes "What kind of sickness did/do you have?_____
57. DANGER	--	0-no 1-yes, at least one dust-related instance 2-yes but not dust related 6-9 as above	2-68	39. "Since January 1, have you ever been faced with any dangerous work situation?" _____ Yes (1) / / _____ No (2) _____ Don't Remember (3) _____ Can't Say (4) a. If yes "How many times?"_____ / / For each occasion, "what type of danger" 1._____ / / 2._____ / / 3._____ / / 4._____ / / 5._____ / /
58. DANGACT1	Refuse Work	0-not mentioned	2-69	39 c. What did you do?_____
59. DANGACT2	Talk to Foreman	1-mentioned	2-70	
60. DANGACT3	Talk to Union Official	2-not applicable	2-71	
61. DANGACT4	Talk to H & S Representative		2-72 2-73	
62. DANGACT5	Talk to Fellow Workers			

Name	Variable Label	Value Labels	Card Col.	Sources and Comments
63. FUTDANG1	Refuse Work	0-no mention	2-74	40. If you felt the dust levels in your work area were too high the next time you were at work/ what would you do?
64. FUTDANG2	Talk to Foreman	1-mentioned	2-75	
65. FUTDANG3	Talk to Union	6-9 as above	2-76	
66. FUTDANG4	Talk to H & S Representative		2-77	
67. FUTDANG5	Talk to Fellow		2-78	
68. FUTDANG6			2-79	

APPPENDIX D

Correlation Coefficients Among
Exogenous Variables
Part I

Exogenous Variables	Plant	Sex	Age	Compounding Location	Night-shift	Size of Household	Number of Incomes for Household	Health Rating	Number of Illnesses	Treated by Doctor	Number of Cigarettes	Never Learned About Asbestos
Plant	1.00											
Sex	-.286*** (91)	1.00										
Age	-.156* (90)	.264*** (90)	1.00									
Compounding Location	.192** (89)	.114 (89)	-.143* (88)	1.00								
Nightshift	-.036 (91)	.000 (91)	-.242** (90)	.147* (89)	1.00							
Size of Household	-.137* (91)	.108 (91)	.013 (90)	.145* (89)	-.053 (91)	1.00						
Number of Incomes per Household	-.078 (88)	-.240** (88)	.010 (87)	-.213** (86)	-.101 (88)	.281*** (88)	1.00					
Health Rating	-.046 (89)	.176** (89)	.367*** (88)	.020 (87)	-.198** (89)	-.112 (89)	-.145* (87)	1.00				
Number of Illnesses	.045 (91)	.082 (91)	-.003 (90)	-.014 (89)	-.133 (91)	.116 (91)	-.004 (88)	.261*** (89)	1.00			
Treated by Doctor	.009 (91)	.033 (91)	-.206** (90)	.137 (89)	-.074 (91)	.184** (91)	.025 (88)	.145* (89)	.698*** (91)	1.00		
Number of Cigarettes	.007 (91)	-.059 (91)	.092 (90)	-.019 (89)	.004 (91)	.091 (91)	.046 (88)	-.081 (89)	-.022 (91)	-.057 (91)	1.00	
Never Learned About Abestos	.038 (91)	.083 (91)	-.010 (90)	-.025 (89)	-.118 (91)	-.047 (91)	-.079 (88)	-.018 (89)	-.029 (91)	-.033 (91)	.033 (91)	1.00
Sick Because of Dust	-.153* (89)	.078 (89)	-.023 (88)	.000 (87)	.101 (89)	.035 (89)	-.096 (86)	.250*** (87)	.238** (89)	.138* (89)	-.160* (89)	-.078 (89)
# of Others Known Sick Because of Dust	.283*** (88)	.291*** (88)	.353*** (87)	.088 (86)	-.283*** (88)	-.017 (88)	-.129 (85)	.289*** (87)	.239** (88)	.039 (88)	-.088 (88)	.237** (88)
Relative Wage	.005 (85)	.148* (85)	.318*** (84)	.095 (85)	.006 (85)	.070 (85)	.017 (82)	.005 (83)	-.070 (85)	.011 (85)	-.033 (85)	-.044 (85)
Faced Danger at Work	.166* (91)	.085 (91)	-.238** (90)	.366*** (89)	.241** (91)	.041 (91)	-.045 (88)	-.066 (89)	.102 (91)	.119 (91)	-.242** (91)	.007 (91)
Union Officer	.110 (91)	.133 (91)	.176** (90)	-.138* (89)	-.106 (91)	.093 (91)	.089 (88)	.176** (89)	.347*** (91)	.237** (91)	-.242** (91)	-.025 (91)
Number of Inspector Visits	-.199** (86)	.147* (86)	.120 (85)	-.048 (84)	.041 (86)	.230** (86)	-.108 (83)	.104 (84)	-.045 (86)	.001 (86)	-.158* (86)	-.080 (86)
Overtime in June	-.327*** (87)	.139* (87)	.102 (87)	-.016 (85)	-.168* (87)	.041 (87)	.214** (86)	-.024 (86)	-.043 (87)	-.049 (87)	-.126 (87)	.063 (87)

* Significantly different from zero for a two-tail t-test at the .10 level.
** Significant at the .05 level.
*** Significant at the .01 level.

APPENDIX D

Correlation Coefficients Among Exogenous Variables Part II

	Sick Because of Dust	# of Others Sick Because of Dust	Relative Wage	Faced Danger at Work	Union Officer	Number of Inspector Visits	Overtime in June
Sick Because of Dust	1.00						
# of Others Known Sick Because of Dust	.019 (87)	1.00					
Relative Wage	-.016 (83)	.008 (82)	1.00				
Faced Danger at Work	.214** (89)	.073 (88)	.181** (85)	1.00			
Union Officer	.137 (89)	.324*** (88)	-.021 (85)	.039 (91)	1.00		
Number of Inspector Visits	.077 (84)	.196** (83)	-.059 (80)	-.097 (86)	.150* (86)	1.00	
Overtime in June	-.109 (85)	-.127 (84)	.078 (81)	-.068 (87)	.036 (87)	.064 (82)	1.00

* Significantly different from zero for a two-tail t-test at the .10 level.
** Significant at the .05 level.
*** Significant at the .01 level.

Ontario

Royal Commission on Matters of Health and Safety Arising from the Use of Asbestos in Ontario

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